



PROJECT ID:

F175QUEEN

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/buildnyc

LAW

VOLUME 1 OF 3

BID BOOKLET

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

NEW EMS STATION 50

LOCATION:
BOROUGH:
CITY OF NEW YORK

159-10 Goethals Avenue
Queens 11432

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

FDNY

Dean/Wolf Architects



Date:

April 25, 2013

3-050



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

DAVID J. BURNEY, FAIA
Commissioner

CAROL DIAGOSTINO
Agency Chief
Contracting Officer

October 16, 2013

CERTIFIED MAIL - RETURN RECEIPT REQUEST
CALCEDO CONSTRUCTION CORPORATION
10 Midland Avenue
Port Chester, NY 10573

RE: FMS ID: F175QUEEN
E-PIN: 85013B0106001
DDC PIN: 8502013FI0003C
NEW EMS STATION 50 - BOROUGH OF
QUEENS
NOTICE OF AWARD

Dear Contractor:

You are hereby awarded the above referenced contract based upon your bid in the amount of \$14,710,371.00 submitted at the bid opening on July 17, 2013. Within ten (10) days of your receipt of this notice of award, you are required to take the actions set forth in Paragraphs (1) through (3) below. For your convenience, attached please find a copy of Schedule A of the General Conditions to the Contract, which sets forth the types and amounts of insurance coverage required for this contract.

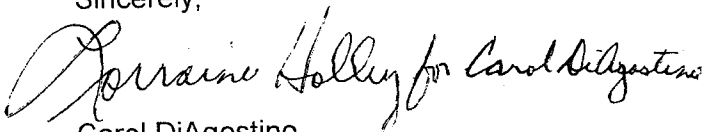
- (1) Execute four copies of the Agreement in the Contracts Unit, 30-30 Thomson Avenue, 1st Floor, Long Island City, New York (IDCNY Building). A Commissioner of Deeds will be available to witness and notarize your signature. The Agreement must be signed by an officer of the corporation or a partner of the firm.
- (2) Submit to the Contracts Unit four properly executed performance and payment bonds. If required for this contract, copies of performance and payment bonds are attached.
- (3) Submit to the Contracts Unit the following insurance documentation: (a) original certificate of insurance for general liability in the amount required by Schedule A, and (b) original certificates of insurance or other proof of coverage for workers' compensation and disability benefits, as required by New York State Law. The insurance documentation specified in this paragraph is required for registration of the contract with the Comptroller's Office.



On or before the contract commencement date, you are required to submit all other certificates of insurance and/or policies in the types and amounts required by Schedule A. Such certificates of Insurance and/or policies must be submitted to the Agency Chief Contracting Office, Attention: Risk Manager, Fourth Floor at the above indicated department address.

Your attention is directed to the section of the Information for Bidders entitled "Failure to Execute Contract". As indicated in this section, in the event you fail to execute the contract and furnish the required bonds within the (10) days of your receipt of this notice of award, your bid security will be retained by the City and you will be liable for the difference between your bid price and the price for which the contract is subsequently awarded, less the amount of the bid security retained.

Sincerely,


Carol DiAgostino

**BID FORM
THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES**

**BID FOR FURNISHING ALL LABOR AND
MATERIAL NECESSARY AND REQUIRED FOR:**

PROJECT ID: F175QUEEN

**NEW EMS STATION 50
159-10 Goethals Avenue
Queens 11432**

Name of Bidder: Calcedo Construction Corp.

Date of Bid Opening: 7/ 17/ 13

Bidder is: (Check one, whichever applies) Individual () Partnership () Corporation (☒)

Place of Business of Bidder: 10 Midland Ave. Port Chester NY 10573

Bidder's Telephone Number: 9149350000 Bidder's Fax Number: 9149350385

Bidder's Email Address: jct@calcedo.com

Residence of Bidder (If Individual): _____

If Bidder is a Partnership, fill in the following blanks:

Names of Partners

Residence of Partners

If Bidder is a Corporation, fill in the following blanks:

Organized under the laws of the State of NY

Name and Home Address of President: Joseph C. Tomei
21 Bishop Rd. Bedford NY 10506

Name and Home Address of Secretary: Evelyn Tomei
21 Bishop Rd. Bedford NY 10506

Name and Home Address of Treasurer: Same as Secretary

BID FORM

PROJECT ID: F175QUEEN

TOTAL BID PRICE: In the space provided below, the Bidder shall indicate the total bid price in figures.

- A. **LUMP SUM PRICE** - Total price for all labor and material for all required work, excluding items (B) and (C) set forth below. Total Price shall include all costs and expenses, i.e. labor, material overhead and profit for all the Work, described and shown in the drawings and specifications.

Total Price For
Labor

Total Price for Material Sold and
Delivered

\$ 8,633,208

+

\$ 5,755,473

Total Price for Item A = \$ 14,388,681

- B. **ALLOWANCE** for Incidental Asbestos Abatement
(Section 028013 of the Specifications)

\$15,000.00

- C. **AMOUNT** for Proprietary Items (pages 2a)

\$306,690.00

TOTAL BID PRICE (Add A + B + C)
(a/k/a BID PROPOSAL)

\$ 14,710,371

BIDDER'S SIGNATURE AND AFFIDAVIT

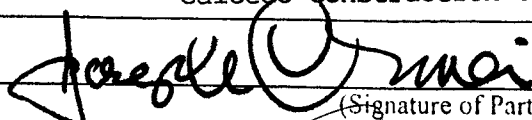
- * **SUBCONTRACTOR IDENTIFICATION:** You **MUST** complete and submit the form entitled "Bidder's Identification of Subcontractors" (page 17) at the time you submit your bid. You must submit this form in a separate, sealed envelope (**BID ENVELOPE #2**). In the event an award of contract is not made to the Bidder, the Bidder hereby authorizes the Agency to shred the form entitled "Bidder's Identification of Subcontractors". Yes ☐ No ☒

- * **M/WBE UTILIZATION PLAN:** By signing its bid in the space below, the bidder agrees to the Vendor Certification and Required Affirmations set forth below, unless a full waiver of the Participation Goals is granted. The Vendor Certification and Required Affirmations will be deemed to satisfy the requirement to complete Section V of Part II of Schedule B: M/WBE Utilization Plan.

Section V: Vendor Certification and Required Affirmations: I hereby: 1) acknowledge my understanding of the M/WBE participation requirements as set forth in this Contract and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York and the rules promulgated thereunder; 2) affirm that the information supplied in support of the M/WBE Utilization Plan is true and correct; 3) agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract; 4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and 5) agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or If a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Bidder: Calcedo Construction Corp.


By:



(Signature of Partner or corporate officer)

Attest:

(Corporate Seal)


Secretary of Corporate Bidder

Affidavit on the following page should be subscribed and sworn to before a Notary Public

BID FORM (TO BE NOTARIZED)

AFFIDAVIT WHERE BIDDERS IS AN INDIVIDUAL

STATE OF NEW YORK, COUNTY OF _____ ss:

_____ being duly sworn says:
I am the person described in and who executed the foregoing bid, and the several matters therein stated are in all respects true.

(Signature of the person who signed the Bid)

Subscribed and sworn to before me this
_____ day of _____,

Notary Public

AFFIDAVIT WHERE BIDDERS IS A PARTNERSHIP

STATE OF NEW YORK, COUNTY OF _____ ss:

_____ being duly sworn says:
I am a member of _____ the firm described in and which executed the foregoing bid.
subscribed the name of the firm thereto on behalf of the firm, and the several matters therein stated are in all respects true.

(Signature of Partner who signed the Bid)

Subscribed and sworn to before me this
_____ day of _____,

Notary Public

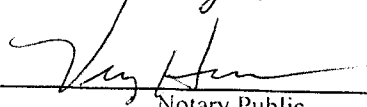
AFFIDAVIT WHERE BIDDERS IS A CORPORATION

STATE OF NEW YORK, COUNTY OF _____ Westchester ss:

_____ Joseph C. Romei being duly sworn says:
I am the President of the above named corporation whose name is subscribed to and which executed
the foregoing bid. I reside at 21 Bishop Rd. Bedford NY 10506
I have knowledge of the several matters therein stated, and they are in all respects true.


(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this
12th day of July, 2013


Notary Public

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2013

AFFIRMATION

The undersigned bidder affirms and declares that said bidder is not in arrears to the City of New York upon debt, contract or taxes and is not a defaulter, as surety or otherwise, upon obligation to the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except NONE

(If none, the bidder shall insert the word "None" in the space provided above.)

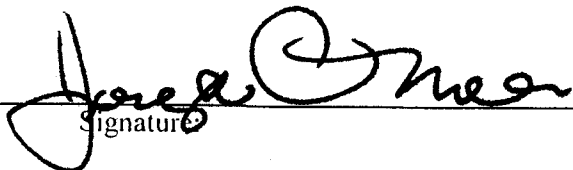
Full Name of Bidder: Calcedo Construction Corp.
Address: 10 Midland Ave.
City: Port Chester State: NY Zip Code: 10573

CHECK ONE BOX AND INCLUDE APPROPRIATE NUMBER:

- ☐ A - Individual or Sole Proprietorship *
SOCIAL SECURITY NUMBER

- ☐ B - Partnership, Joint Venture or other unincorporated organization
EMPLOYER IDENTIFICATION NUMBER

- ☒ C - Corporation
EMPLOYER IDENTIFICATION NUMBER
13-2599516

By: 
Signature

Title: President

If a corporation, place seal here

This affirmation must be signed by an officer or duly authorized representative.

* Under the Federal Privacy Act the furnishing of Social Security Numbers by bidders on City contracts is voluntary. Failure to provide a Social Security Number will not result in a bidder's disqualification. Social Security Numbers will be used to identify bidders, proposers or vendors to ensure their compliance with laws, to assist the City in enforcement of laws, as well as to provide the City a means of identifying of businesses which seek City contracts.

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
CONTRACT 1 - GENERAL CONSTRUCTION WORK								
01 0000	GENERAL REQUIREMENTS							
	MOBILIZATION		LS					300,000
	SECURITY GUARDS / FIRE GUARDS ON SITE		LS					366,730
	BONDS & INSURANCE		LS					343,412
	subtotal							1,010,142
02 0000	EXISTING CONDITIONS							
02 6100	REMOVAL AND DISPOSAL OF CONTAMINATED SOILS		LS					508,097
	subtotal							508,097
02 8213	ASBESTOS ABATEMENT		LS					88,146
	subtotal							88,146
03 0000	CONCRETE							
03 3000	CAST-IN-PLACE CONCRETE							
03 3300	ARCHITECTURAL CAST-IN-PLACE CONCRETE							
03 4113	PRE-CAST CONCRETE HOLLOW CORE PLANKS							
03 5300	CONCRETE TOPPING							
	12" CONCRETE WALL	893	CY	440.87	393,693	1,047.06	935,021	1,328,713
	14" CONCRETE WALL	-----	CY	-----	-----	-----	-----	Incl. in 12"
	FORM LINER	-----	SF	-----	-----	-----	-----	Incl. in 12"
	16" PRECAST CONC PLANK	2900	SF	20.15	58,425	20.71	60,058	118,483
	4" CONCRETE TOPPING	3294	SF	3.31	10,892	4.96	16,337	27,229
	3" CONC RAT SLAB	3346	SF	2.76	9,220	4.41	14,751	23,971
	5" SOG	279	SF	275.54	76,876	457.65	127,685	204,560
	14" SLAB ON GRADE	-----	CY	-----	-----	-----	-----	Incl. in 5"SOG
	12" SLAB ON GRADE	-----	CY	-----	-----	-----	-----	Incl. in 5"SOG
	CONCRETE ON METAL DECK	4594	SF	4.41	20,253	5.51	25,317	45,570
	CONCRETE AT STEEL PAN STR	42	FLT	31.49	1,323	78.73	3,306	4,629
	CONCRETE STAIRS	-----	FLT	-----	-----	-----	-----	Incl. in Sitewk
	subtotal							1,753,156

FMS ID NUMBER
 CLIENT AGENCY
 F175QUEEN
 FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
04 0000	MASONRY							
04 2000	UNIT MASONRY							
	CMU PARTITIONS		SF		103,603		155,405	259,008
	CMU VENEER	-----	SF	-----	-----	-----		Inc. in Partitions
	subtotal							259,008
05 5000	METALS							
05 1223	STRUCTURAL STEEL							
05 1225	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL							
	STRUCT STL TRUSSES/FRM/COL	179	TON	2,319.30	415,155	3,014.50	539,595	954,750
	MOMENT CONN	47	EA	3,227.09	151,673	4,193.83	197,110	348,783
	subtotal							1,303,533
05 3100	METAL DECKS							
	2" 18 GA DECKING		SF	-----	-----	-----	-----	-----
	1 1/2" 18 GA DECKING	6803	SF	2.17	14,786	2.05	13,948	28,733
	1 1/2" 16 GA DECKING	12595	SF	2.24	28,201	2.11	26,605	54,806
	subtotal							83,540
05 4000	COLD FORMED METAL FRAMING							
05 5000	MISCELLANEOUS METALS							
	LOOSE RAILS		LF	-----	-----	-----		Incl. in Misc. Metal
	MISC. STEEL		LS	-----	-----	-----		330,649
	ORNAMENTAL ALUM EXT PNL		SF	-----	-----	-----		Incl. in Misc. Metal
	ALUM EXTERIOR FASCIA 30"		LF		18,186		12,124	30,310
	ORNAMENTAL MTL. HANDRAILS		LF	-----	-----	-----		Inc. in Stairs
	ORNAMNT STL/GLS RAIL @BLCNY		LF	-----	-----	-----		Inc. in Stairs
	subtotal							360,959
05 5100	STEEL PAN STAIRS	2	FLGT					60,619
	subtotal							60,619
05 6000	STRUCTURAL BEARING ASSEMBLIES (INCLUDED ABOVE)							60,619

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
06 0000	WOODS, PLASTICS AND COMPOSITES							
06 2000	CARPENTRY							
06 4023	ARCHITECTURAL WOODWORK							
	WORKSTATION		LF		12,686		19,029	31,715
	subtotal							31,715
07 0000	THERMAL/MOISTURE PROTECTION							
07 1616	CRYSTALLINE WATERPROOFING				52,904		52,904	105,808
	FOUNDATION WATERPROOF		SF					
	subtotal							105,808
07 2100	THERMAL INSULATION		(INCLUDED)		42,026		63,037	105,063
07 2616	BELOW GRADE VAPOR RETARDERS		(INCLUDED)		12,704		19,055	31,759
07 4243	ALUMINUM COMPOSITE WALL PANELS				191,558		267,498	459,057
	SOFFIT-ALUMINUM PANEL		SF	-----	-----	-----		Incl. Alum comp.
	ALUMINUM PNL. AT END WALL		SF	-----	-----	-----		Incl. Alum comp.
	subtotal							595,878
07 5419	POLYVINYL-CHLORIDE (PVC) ROOFING							
	SARNAFIL ROOFING		SF		134,116		201,172	335,288
	subtotal							335,288
07 6200	SHEET METAL WORK		(INCLUDED)					Incl. in Spec 075419
07 7100	ROOF SPECIALTIES AND ACCESSORIES							
	ROOF HATCH 3-6X3-6		EA					Incl. in Spec 075419
	subtotal							
07 8413	FIRESTOPS AND SMOKESEALS				15,011		10,008	25,019
07 9200	JOINT SEALERS							
	CAULKING		SF		2,204		3,306	5,511
	subtotal							30,530

PROJECT: NEW EMS STATION 50
LOCATION: 159-10 Goethals Avenue, Queens, NY 11432
BIDDER: CALCEDO CONSTRUCTION CORP.

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
08 0000	OPENINGS							
08 1113	STEEL DOORS AND FRAMES							
	HM DR/FR	50	EA	530.91	26,546	447.48	22,374	48,920
	EXT HM DR/FR		EA					Incl. in HM
	subtotal							48,920
08 3113	ACCESS DOORS		(INCLUDED)					3,858
08 3600	SECTIONAL OVRHEAD DOORS							
	SECTIONAL DOOR ASSEMBLY (see Bid Booklet page 2a)		SF					
	subtotal							3,858
08 4413	GLAZED ALUMINUM CURTAIN WALLS							
	EXT GLASS CURTAIN WALL	1500	SF	99.19	148,792	66.13	99,195	247,987
	GLASS PATTERNING	6762	SF	102.50	693,113	68.38	462,417	1,155,530
	PROJECTION WINDOWS	374	EA	115.73	43,282	77.15	28,855	72,137
	FIRE RATED GLAZING	202	SF	495.91	100,173	212.53	42,931	143,105
	GLASS TRANSOM	450	SF	53.70	24,167	35.80	16,111	40,279
	ALUM/GLASS DOORS	4	PR	7,264.36	29,057	4,842.91	19,372	48,429
	subtotal							1,707,466
08 7100	FINISH HARDWARE							
	SETS	50	EA	532.23	26,612	595.17	29,758	56,370
	subtotal							56,370
08 7300	AUTOMATIC DOOR OPERATORS		(INCLUDED)					Incl. in 083600
08 8000	GLASS AND GLAZING		(INCLUDED)					Incl. in 084413
08 9000	LOUVERS AND VENTS		(INCLUDED)		9,324		3,654	12,978
08 9119	EXTRUDED ALUMINUM STATIONARY LOUVERS		(INCLUDED)					Incl. in 089119
	subtotal							12,978
09 0000	FINISHES							
09 2116	GYPSUM BOARD SHAFT WALL ASSEMBLIES							
09 2900	GYPSUM DRYWALL							
	EXTERIOR FRAMING/INSUL	4116	SF	6.61	27,219	11.02	45,365	72,584

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	CORRIDOR PARTITION	2170	SF	5.51	11,958	9.37	20,329	32,288
	STAIR PARTITION	376	SF	5.51	2,072	8.82	3,315	5,387
	SHAFT FURRING	544	SF	7.72	4,197	13.23	7,195	11,392
	CHASE PARTITION	1132	SF	6.61	7,486	11.02	12,476	19,962
	INTERIOR PARTITION	4999	SF	4.96	24,794	9.92	49,587	74,382
	EXT FURRING	3719	SF	4.28	15,922	8.62	32,076	47,998
	BALCONY FASCIA SOFFIT	2581	SF	5.51	14,223	12.12	31,292	45,515
	GYP CEILINGS	8178	SF	9.37	76,615	11.85	96,896	173,510
	subtotal							483,019
09 3000	CERAMIC TILE							
	CERAMIC FLOOR		SF		58,789		88,184	146,974
	CERAMIC WALL		SF					Incl. in Cer. Flr. 146,974
	subtotal							
09 6500	RESILIENT TILE FLOORING AND BASE							
	RUBBER FLOOR TILE/BASE		SF		16,670		25,004	41,674
	subtotal							41,674
09 6510	RESILIENT SHEET FLOORING		SF					Incl. in 096500 0
	subtotal							0
09 6813	CARPET TILE		SF					Incl. in 096500 0
	subtotal							0
09 9000	PAINTING AND FINISHING				35,931		53,896	89,826
	INTUMESCENT COATINGS				55,108		55,108	110,216
	GYP WALLS		SF					Incl. in 099000
09 9646	CMU/CONC WALLS		SF					Incl. in 099000
	GP CEILINGS		SF					Incl. in 099000
	EXPOSED CEILINGS		SF					Incl. in 099000
	STAIRS		FLGT					Incl. in 099000
	GARAGE FLOOR		SF					Incl. in 099000
	subtotal							200,043

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
10 0000	SPECIALTIES							
10 2114	TOILET PARTITIONS							
	TOILET PARTITIONS		STALL		4,023		4,023	8,046
	subtotal							8,046
10 2800	TOILET ACCESSORIES							
	TOILET MIRRORS		EA					Inc. in Access.
	TOILET ACCESSORIES	42	FIXT	141.18	5,930	128.59	5,401	11,330
	subtotal							11,330
10 4000	SIGNAGE							
	STL STL LASER CUT SIGNAGE		LTR					31,866
	STAR OF LIFE PLAQUE		EA					Inc. in above
	FDNY PLAQUE		EA					Inc. in above
	INTERIOR SIGNAGE		DR					Inc. in above
	subtotal							31,866
10 4416	FIRE EXTINGUISHERS AND CABINETS							
	DWYER UNIT	4	LS	192.88	772	330.65	1,323	2,094
	subtotal							2,094
10 5513	LOCKERS							
	LOCKERS AND BENCHES	105 + 7	LS		19,178		28,766	47,944
	subtotal							47,944
10 7500	FLAG POLES							
	NYC PARKS STD FLAG POLE		EA		3,913		5,511	9,423
	subtotal							9,423
10 9000	MISC. SPECIALTIES							
	subtotal							50,821
11 0000	EQUIPMENT							
11 2600	UNIT KITCHENS		LS	0.00	0	0.00	0	0
	subtotal							0

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
11 3100	RESIDENTIAL APPLIANCES		LS		4,739		0	4,739
	subtotal							4,739
12 0000	FURNISHINGS							
12 2413	WINDOW SHADES	30	LS					11,187
12 0640	FURNITURE / SCHEDULE				130,172		20,544	150,716
	subtotal							161,903
12 4816	FOOT GRILLS		LS		2,426		331	2,757
	subtotal							2,757
14 0000	CONVEYING EQUIPMENT							
14 2400	HYDRAULIC ELEVATORS							
	3 STOP HYDRAULIC ELEV	1	EA					114,454
	subtotal							114,454
21 0000	FIRE SUPPRESSION							
	SPRINKLER HEADS	26	EA	19.84	516	33.06	860	1,376
	FIRE PUMP		EA	0.00	0	0.00	0	0
	ZONE CONTROL ASSEMBLY	1	EA	2,204.33	2,204	3,306.49	3,306	5,511
	SIAMESE CONNECTION	1	EA	2,149.22	2,149	3,251.38	3,251	5,401
	PIPE, 1"	150	LF	4.96	744	33.06	4,960	5,704
	PIPE, 1.25"	60	LF	4.74	284	28.11	1,686	1,971
	PIPE, 1.5"	60	LF	5.29	317	28.66	1,719	2,037
	PIPE, 2"	80	LF	9.92	794	32.51	2,601	3,395
	PIPE, 2.5"	70	LF	11.68	818	38.58	2,700	3,518
	PIPE, 3"	50	LF	15.98	799	49.60	2,480	3,279
	PIPE, 4"	100	LF	17.52	1,752	60.62	6,062	7,814
	HANGERS / SLEEVES / INSERTS		LF		4,603		5,705	10,307
	VALVES / TRAPS / MISC		LF		5,125		5,125	10,250
	SAFETY / SITE LOGISTICS		TD		551		551	1,102
	VIBRATION / SEISMIC BRACING		TD		4,850		5,952	10,801
	TESTING		TD		1,792		2,894	4,686
	subtotal							77,151

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
22 0000	PLUMBING							
	FIXTURES/EQUIPMENT							
	WATER CLOSET	6	EA	551.08	3,306	771.51	4,629	7,936
	WATER CLOSET, H/C		EA					
	URINAL	2	EA	495.97	992	661.30	1,323	2,315
	LAVATORY	7	EA	385.76	2,700	385.76	2,700	5,401
	STAINLESS STEEL SINK	1	EA	3,306.49	3,306	1,102.16	1,102	4,409
	SOIL SINK	2	EA	991.95	1,984	330.65	661	2,645
	DEEP SINK		EA					
	E/M EYEWASH	1	EA	2,204.33	2,204	1,653.25	1,653	3,858
	SHOWER		EA					
	ELECTRIC EYE OPERATOR		EA					
	HOT WATER HEATER	2	EA	3,306.49	6,613	1,653.25	3,306	9,919
	HOT WATER HEATER, POINT OF USE		EA					
	CIRCULATING PUMP	1	EA	4,959.74	4,960	1,653.25	1,653	6,613
	SEWAGE EJECTOR PUMP		EA					
	SUMP PUMP		EA					
	subtotal							43,095
	PIPING							
	DOMESTIC WATER							
	PIPE, .5"	20	LF	6.61	132	11.02	220	353
	PIPE, .75"	310	LF	11.02	3,417	13.23	4,100	7,517
	PIPE, 1"	130	LF	13.23	1,719	15.43	2,006	3,725
	PIPE, 1.25"	180	LF	17.63	3,174	17.63	3,174	6,348
	PIPE, 1.5"	120	LF	23.15	2,777	19.84	2,381	5,158
	PIPE, 2"	30	LF	27.55	827	22.04	661	1,488
	subtotal							24,589
	SANITARY / WASTE							
	PIPE, 1.5"	-----	LF	8.82		39.68		0
	PIPE, 2"	310	LF	11.02	3,417	41.88	12,983	16,400
	PIPE, 3"	160	LF	16.53	2,645	44.09	7,054	9,699
	PIPE, 4"	300	LF	18.74	5,621	46.29	13,887	19,508
	subtotal							45,608

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
STORM	PIPE, 4"	180	LF	22.04	3,968	46.29	8,332	12,300
	PIPE, 6"	80	LF	24.25	1,940	48.50	3,880	5,819
	PIPE, 8"	100	LF	27.55	2,755	50.70	5,070	7,825
	subtotal							25,945
	GAS							
	PIPE, 1"		LF					
	PIPE, 1.25"	180	LF	6.61	1,190	48.50	8,729	9,919
	PIPE, 1.5"		LF					
	PIPE, 2"	40	LF	11.02	441	55.11	2,204	2,645
	PIPE, 2.5"		LF					
	PIPE, 3"		LF					
	PIPE, 4"	190	LF	26.45	5,026	62.82	11,936	16,962
	subtotal							29,527
	INSULATION							
	PIPE, .5"	20	LF	25.35	507	55.11	1,102	1,609
	PIPE, .75"	310	LF	26.45	8,200	55.11	17,084	25,284
	PIPE, 1"	130	LF	27.55	3,582	77.15	10,030	13,612
	PIPE, 1.25"	190	LF	29.76	5,654	77.15	14,659	20,313
	PIPE, 1.5"	120	LF	33.06	3,968	99.19	11,903	15,871
	PIPE, 2"	30	LF	36.37	1,091	99.19	2,976	4,067
	subtotal							80,756
	SITework							
	MANHOLE / HOUSE TRAP		EA					
	RETENTION TANK		EA					
	GROUND WATER RETENTION TANK/SYSTEM		EA					
	TRENCH DRAIN		LF					
	CURB BOX / SHUT-OFF VALVE	2	EA	1,322.60	2,645	3,526.92	7,054	9,699
	PIPE, 2" DOMESTIC WATER	65	LF	39.00	2,535	40.70	2,645	5,180
	PIPE, 4", FIRE	65	LF	84.78	5,511	81.39	5,290	10,801
	PIPE, 4", DIP		LF					
	PIPE, 10", DIP	50	LF	176.35	8,817	193.98	9,699	18,516

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	TRENCH / FILL / REPLACE PAVEMENT	120	LF	211.25	25,350	132.26	15,871	41,221
	CONNECT TO EXISTING	1	EA	4,739.30	4,739	3,526.92	3,527	8,266
	subtotal							93,684
	MISC. EQUIPMENT & PROCEDURES							
	HANGERS/SLEEVES/INSERTS	300	LF	88.17	26,452	165.32	49,597	76,049
	VALVES/TRAPS/MISC.	12	LF	49.60	595	87.07	1,045	1,640
	GAS VALVE	12	EA	220.43	2,645	93.68	1,124	3,769
	GAS METER RIG/SHUT OFF	1	EA	77.15	77	98.09	98	175
	WAER METERS, RPZ'S / BFP'S	1	EA	2,755.41	2,755	1,102.16	1,102	3,858
	DEMOLITION	1	TD	7,715.15	7,715	0.00	0	7,715
	SAFETY / SITE LOGISTICS		TD					
	VIGRATION / SEISMIC BRACING		EA					
	TESTING	1	TD	5,510.82	5,511	0.00	0	5,511
	RELOCATE SEWER LINE		EA					
	FUEL OIL TANK/ PIPING	1	EA	89,416.34	89,416	134,124.50	134,125	223,541
	FLOOR DRAINS	13	EA	440.87	5,731	121.24	1,576	7,307
	ROOF DRAINS	11	EA	661.30	7,274	1,102.16	12,124	19,398
	EQUIPMENT CONNECTIONS		EA					
	CONNECT KITCHEN EQUIPMENT		EA					
	SLEEVE / FIREPROOF		EA					
	subtotal							348,964
	HVAC							
	EQUIPMENT							
	RTU 3, 4, 5, 6, -5 TONS	4	EA	13,363.73	53,455	1,818.57	7,274	60,729
	RTU 1, 2, -6 TONS	2	EA	9,368.39	18,737	1,818.57	3,637	22,374
	A/C 1, 2, 3, 4	4	EA	1,391.48	5,566	1,136.61	4,546	10,112
	A/C 2-1, 2-2	2	EA	1,653.25	3,306	956.13	1,912	5,219
	AIR COOLED CONDENSER	1	EA	18,736.78	18,737	1,818.57	1,819	20,555
	MAKE UP AIR UNIT, 2,000 CFM		EA					
	UNIT HEATER	4	EA	3,912.68	15,651	1,102.16	4,409	20,059
	TRUCK EXHAUST	1	EA	2,474.36	2,474	1,102.16	1,102	3,577
	TOILET EXHAUST FANS	1	EA	2,474.36	2,474	1,102.16	1,102	3,577
	GARAGE EXHAUST FAN	1	EA	2,474.36	2,474	1,102.16	1,102	3,577

23 0000

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
EXHAUST FAN	EXHAUST FAN	1	EA	2,474.36	2,474	1,102.16	1,102	3,577
	SMOKE EXHAUST FAN	1	EA	2,474.36	2,474	1,102.16	1,102	3,577
	DECON FAN	1	EA	2,474.36	2,474	1,102.16	1,102	3,577
	subtotal							160,508
	PIPE							
	PIPE, 1", DRAIN	100	LF	4.41	441	35.27	3,527	3,968
	PIPE, 1.25"		LF					
	PIPE, 1.5"		LF					
	subtotal							3,968
	PIPE REFRIDGERANT							
	PIPE, .5"	200	LF	3.03	606	79.36	15,871	16,477
	PIPE, 0.625"	200	LF	3.03	606	79.36	15,871	16,477
	subtotal							32,955
	SHEETMETAL							
DUCTWORK	DUCTWORK	12000	LBS	11.02	132,260	0.00	0	132,260
	SUPPLY REGISTERS	3	EA	82.66	248	110.22	331	579
	RETURN REGISTERS	2	EA	82.66	165	110.22	220	386
	RETURN REGISTERS, FBR	67	LF	55.11	3,692	27.55	1,846	5,538
	LINEAR DIFFUSERS	203	LF	55.11	11,187	27.55	5,593	16,780
	GARAGE EXHAUST DUCT & CONNECTIONS	see Bid	LBS				1,819	1,819
	MAGNARAIL & ASSEMBLY ITEMS	Booklet pg	LF				3,637	3,637
	MAGNATRACK & MISC. ASSOCIATED ITEMS	2a	LF				3,637	3,637
	LOUVERS	6	SF	55.11	331	330.65	1,984	2,315
	MOTORIZED DAMPERS	7	EA	33.06	231	1,113.19	7,792	8,024
	ACCESS DOORS	28	EA	11.02	309	55.11	1,543	1,852
	SMOKE/ FIRE DAMPERS	28	EA	82.66	2,315	495.97	13,887	16,202
	subtotal							193,027
INSULATION	DUCT INSULATION	12675	SF	2.48	31,432	4.24	53,722	85,153
	PIPE, .5"	400	LF	0.83	331	5.51	2,204	2,535
	PIPE, 1.25"	100	LF	1.38	138	4.68	468	606
	PIPE, 1.5"		LF					
subtotal								88,294

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
26 0000 27 0000 28 0000	MISC. EQUIPMENT & PROCEDURES							
	HANGERS/ SLEEVES/ INSERTS		LF					
	VALVES / TRAPS / MISC.		LF					
	SUPERVISION		TD					101,537
	VIBRATION / SEISMIC BRACING		EA					
	DEMOLITION		TD					
	EQUIPMENT CONNECTIONS		EA					
	MISC. RELOCATIONS		TD					
	CORE/ SLEEVE/ FIREPROOF		TD					
	TEST & BALANCE		TD					9,368
	subtotal							110,905
	CONTROLS		EA					77,151
	subtotal							77,151
	RIGGING & HOISTING		TD					27,554
	subtotal							27,554
	ELECTRICAL							
	COMMUNICATIONS							
	ELECTRONIC SFETY & SECURITY							
	LIGHTING FIXTURES							
	LIGHT FIXTURE, MATERIAL	497	EA	345.95	171,938	0.00	0	171,938
	LIGHT FIXTURE, INSTALL	523	EA	0.00	0	413.31	216,162	216,162
	LIGHT FIXTURE, LINEAR	48	LF	-----	-----	-----	-----	Incl. in above
	EXIT FIXTURE	15	EA	382.82	5,742	143.28	2,149	7,891
	JUNCTION BOX	23	EA	31.63	727	92.97	2,138	2,866
	BRANCH CIRCUIT	3500	LF	1.64	5,731	10.42	36,482	42,213
	subtotal							441,069
	DEVICES							
	SWITCH	23	EA	110.22	2,535	143.28	3,295	5,830
	SWITCH, 3-WAY	14	EA	55.11	772	127.54	1,786	2,557
	OCCUPANCY SENSOR	13	EA	534.97	6,955	356.93	4,640	11,595
	DIMMER	4	EA	217.68	871	352.69	1,411	2,281

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	RECEPTACLE, DUPLEX	65	EA	23.74	1,543	117.51	7,638	9,181
	RECEPTACLE, DUPLEX, FLOOR MTD.	3	EA	290.24	871	573.13	1,719	2,590
	RECEPTACLE, DOUBLE DUPLEX	89	EA	28.48	2,535	143.28	12,752	15,287
	RECEPTACLE, DUPLEX, 20A	4	EA	112.97	452	212.17	849	1,301
	RECEPTACLE, GFI	19	EA	29.58	562	143.28	2,722	3,284
	RECEPTACLE, GFI, W/P	5	EA	551.08	2,755	421.03	2,105	4,861
	JUNCTION BOX	23	EA	34.98	805	143.28	3,295	4,100
	JUNCTION BOX, W/P	4	EA	115.73	463	217.68	871	1,334
	JUNCTION BOX, FLOOR MTD.	6	EA	112.05	672	170.84	1,025	1,697
	BRANCH CIRCUIT	4200	LF	2.28	9,588	5.01	21,051	30,639
	subtotal							96,537
	SERVICE & DISTRIBUTION							
	CT CABINET / METER PAN	1	EA	6,943.63	6,944	5,841.47	5,841	12,785
	MAIN DISCONNECT SWITCH, 600A	1	EA	5,621.03	5,621	3,857.57	3,858	9,479
	MAIN DISTRIBUTION BOARD, 600A	1	EA	14,217.91	14,218	6,943.63	6,944	21,162
	EM GENERATOR	1	EA	88,062.88	88,063	76,776.72	76,777	164,840
	POWER TO GARAGE DOORS	3	LS	5,143.43	15,430	1,550.38	4,651	20,081
	AUTO TRANSFER SWITCH, 600A	1	EA					
	POWER PANEL	7	EA	2,409.01	16,863	5,224.26	36,570	53,433
	DISCONNECT SWITCHES	20	EA	507.00	10,140	1,159.48	23,190	33,329
	CONDUIT, 1"	3100	LF	1.28	3,957	15.57	48,253	52,209
	CONDUIT, 1.25"	200	LF	2.81	562	17.25	3,450	4,012
	CONDUIT, 1.5"	200	LF	3.47	694	22.10	4,420	5,114
	CONDUIT, 4"	400	LF	11.02	4,409	52.90	21,162	25,570
	WIRE, #18	2000	LF	0.61	1,212	1.65	3,295	4,508
	WIRE, #8	3000	LF	0.34	1,014	1.72	5,147	6,161
	WIRE, #4	1000	LF	1.01	1,010	1.52	1,521	2,531
	WIRE, #3	200	LF	1.27	253	3.80	760	1,014
	WIRE, #2	1000	LF	1.65	1,653	2.69	2,689	4,343
	WIRE, #350	3000	LF	5.51	16,532	4.76	14,284	30,816
	FEEDERS, UNSIZED	100	LF	2.20	220	11.13	1,113	1,334
	CONNECT EQUIPMENT	14	EA	110.22	1,543	183.43	2,568	4,111
	subtotal							456,831

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	SPECIAL SYSTEMS							
	SECURITY SYSTEM	1	EA					87,071
	LIGHTNING PROTECTION SYSTEM	0	EA					
	DECONTAMINATION SYSTEM		EA					
	subtotal							87,071
	MISC. EQUIPMENT & PROCEDURES							
	SAFETY / SITE LOGISTICS	200	MH					28,987
	VIBRATION / SEISMIC BRACING	14	EA					4,629
	DEMOLITION	320	MH					50,700
	TV / OUTLET	10	EA					4,067
	PHONE / DATE OUTLET	17	EA					6,723
	UPS SYSTEM, IF REQUIRED	2	EA					3,747
	TEMP. LIGHT & POWER		SF					10,956
	CORE / SLEEVE / FIREPROF	20	EA					4,309
	GROUNDING	14	EA					4,629
	subtotal							118,747
31 0000	EARTHWORK							
	REMOVALS / EXCAVATION							
	CLEARING AND GRUBBING		SF					
	REMOVE TREES	19	EA					15,871
	TREE RESTITUTION		LOT					
	REMOVE CONCRETE RW/FTG		LF					
	REMOVE CONCRETE PAVING	5648	SF					52,353
	REMOVE ASPHALT PAVING		SF					
	EXCAVATION REMOVALS		TONS					See Page 1
	EXCAVATION CLEAN BACKFILL	1044	TONS					109,114
	subtotal							177,338
	FOUNDATIONS							
	PILES - PIPE PILES	164	EA	1,612.92	264,519	1,216.41	199,492	464,011
	GRADE BEAM 1	135	CY	275.54	37,198	495.97	66,956	104,154
	GRADE BEAM 2		CY				Incl. in Grade Beam 1	
	GRADE BEAM 3		CY				Incl. in Grade Beam 1	

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
32 0000	GRADE BEAM 4		CY				Incl. in Grade Beam 1	
	PILE CAP	172	CY	275.54	47,393	589.53	101,399	148,792
	subtotal							716,957
	EXTERIOR IMPROVEMENTS							
	SITE IMPROVEMENTS							
	ASPHALT PAVING	8376	SF					57,713
	12" CONC RETAINING WALL	76	CY	275.54	20,941	551.08	41,882	62,823
	RW FOOTING/GR BEAM	158	CY	275.54	43,535	495.97	78,364	121,899
	SOIL PREP & CONC FOR RW							
	STREET CURBS	802	LF					30,861
	4" SIDEWALK	7600	SF					92,141
	6" CONCRETE APRON	2.5	SF					
	CONCRETE STAIR	27	EA					33,065
	GENERATOR PAD		CY					827
	STRIPING		SPA					1,102
	PAVING AT NORTH ENTRY		SF					Incl. in above
	LANDSCAPE BRUSH		SF					Incl. in Landcaping
	GRANITE BLOCK AT TREE PITs		SF					8,266
	subtotal							408,697
	MISC SITEWORK							
	5' STEEL FENCING		SF		154,854		154,854	309,708
	STEEL DRIVE GATE		SF					
	subtotal							309,708
	PLANTING							
	TOPSOIL FOR TREES	215	CY	71.64	15,403	0.00	0	15,403
	LAWN COVER		SF					17,084
	PLANTING AT PARKING		SF					Incl. in Lawn Cover
	NEW TREES		EA					Incl. in Lawn Cover
	subtotal							32,486
33 0000	UTILITIES							
	SITE DRAINAGE PIPING SYSTEMS		LS		(Includes Excavation & B.F.)			287,665
	PRECAST CONCRETE DRAINAGE STRUCTURES		LS					11,022
	subtotal							298,686

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
43 0000	PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE EQUIPMENT							
	FUEL SYSTEM							
	EXCAVATION		CY					0
	PEA GRAVEL FILL	95	CY					9,947
	SHEETING	660	SF					16,532
	CONCRETE SLAB 12"	247	SF					9,919
	CONCRETE PUMP ISLAND w/STL. CURB		SF				Incl. in sidewalk & curbs	
	CONCRETE BLOCOK (12") PIER 10'HT.	192	EA					6,348
	STEEL BOLLARDS 6"		EA					None shown
	MANHOLE	1	EA					331
	FUEL STORAGE TANK, PIPE, EQUIPMENT		LS				Incl. in Misc. equip & Procedures	
	ELECTRIC		LS					0
	subtotal							43,078
	POLLUTION AND WASTE CONTROL EQUIPMENT							
	VACUUM EXTRACTION SYSTEM	1	LS					64,696
	subtotal							64,696
	Proporitory Items							306,690
	Allowance							15,000
	CONTRACT 1 - GENERAL CONSTRUCTION WORK							14,710,371
44 0000								

See Attached

A. PROJECT REFERENCES - SIMILAR CONTRACTS COMPLETED BY THE BIDDER

List all contracts substantially completed within the last 4 years similar to the contract being awarded, up to a maximum of 10, in descending order of date of substantial completion.

Project & Location	Contract Type	Contract Amount (\$000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner

**CALCEDO CONSTRUCTION CORP.
COMPLETED PROJECTS**

PROJECT & LOCATION

New Family Intake Center
151 E. 151st St.
Bronx, NY 10451

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$31,272,868.00

ARCHITECT

Polshek Partners
320 West 13th St.
New York, NY 10014
Mr. Tim Hartung
212-807-7171

CONSTRUCTION MANAGER

LiRo Program & Construction Management
3 Aerial Way
Syosset, NY 11791
Mr. Eugene Bifulco
516-938-5476

OWNER

NYC-Dept Design & Construction
Santosh Chambran
718-381-1176

Completion Date

11/15/10

PROJECT & LOCATION

Train Washer @ Highbridge
100 Depot Place
Bronx, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$11,173,920.00

ARCHITECT

STV Inc.

225 Park Avenue So.

New York, NY 10003

Mr. Donald Harris

212-777-4400

OWNER RERERENCE & TEL #

Metro North Railroad

Andrew Igoe

718-293-0946

COMPLETION DATE

09/08

PROJECT & LOCATION

City College-School of Architecture

New York, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$10,957,075.00

ARCHITECT

Rafael Vinoly

50 Vandam St.

New York, NY 10013

Mr. Rafael Vinoly

212-924-5060

OWNER RERERENCE & TEL #

DASNY/Liro Group

Ralph Tilleli

212-368-9038

COMPLETION DATE

8/08

PROJECT & LOCATION

Jacobi Medical Center
1400 Pelham Parkway, Bronx, NY

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$18,699,751.00

ARCHITECT

Pei Cobb Freed Partners
88 Pine St.
New York, NY 10005
Mr. Ivan Kreitman
212-872-4058

OWNER RERERENCE & TEL #

DASNY/TDX Construction Corp.
Raymond Leu
718-409-1907

COMPLETION DATE

09/08

PROJECT & LOCATION

Multi Tenant Industrial Building @ Perry Avenue
Brooklyn, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$8,071,313.00

ARCHITECT

Stantec Architects
50 W. 23rd St.
New York, NY 10010
Mr. James Nelson
212-366-5600

OWNER RERERENCE & TEL #

Brooklyn Navy Yard Development Corp./TDX
Prakash Shah
718-596-4181

COMPLETION DATE

09/08

B. PROJECT REFERENCES - CONTRACTS CURRENTLY UNDER CONSTRUCTION BY THE BIDDER

List all contracts currently under construction even if they are not similar to the contract being awarded.

Project & Location	Contract Type	Contract Amount (\$000)	Subcontracted to Others (\$000)	Uncompleted Portion (\$000)	Date Scheduled to Complete	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner
Lehman College New Science Fac. School Bronx, NY	New -	\$28,423,976	\$19,500,000	\$50,000	9/2013	Chris Wuest DASNY 347-590-9041	Perkins + Will 212 251-7000 Julio Colon

C. PROJECT REFERENCES - PENDING CONTRACTS NOT YET STARTED BY THE BIDDER

NONE

List all contracts awarded to or won by the bidder but not yet started.

Project & Location	Contract Type	Contract Amount (\$000)	Date Scheduled to Start	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner

Qualification Form

Project ID: F175QUEEN

List previous projects completed to meet the special experience requirements for this contract. Please photocopy this form for submission of all required projects.

SEE ATTACHED

Name of Contractor: _____

Name of Project: _____

Location of Project: _____

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: _____

Title: _____ Phone Number: _____

Brief description of work completed: _____

Was the work performed as a prime or a subcontractor: _____

Amount of Contract: _____

Date of Completion: _____

Name of Contractor: _____

Name of Project: _____

Location of Project: _____

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: _____

Title: _____ Phone Number: _____

Brief description of work completed: _____

Was the work performed as a prime or a subcontractor: _____

Amount of Contract: _____

Date of Completion: _____

**CALCEDO CONSTRUCTION CORP.
COMPLETED PROJECTS**

PROJECT & LOCATION

Lehman College New Science Facility
2990 Goulden Avenue
Bronx, NY 10461

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$28,091,000.00

ARCHITECT

Perkins + Will
215 Park Avenue South
New York, NY 10003
Mr. Julio Colon
212-251-7000

CONSTRUCTION MANAGER

Gilbane Building Corp.
88 Pine Street
New York, NY 10005
Mr. John DiBiase
212-312-1600

OWNER

Dormitory Authority State of NY
One Penn Plaza
New York, NY 10019
Mr. Michael Stabulas
212-273-5000

COMPLETION DATE

04/13

PROJECT & LOCATION

New Family Intake Center
151 E. 151st St.
Bronx, NY 10451

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$31,272,868.00

ARCHITECT

Polshek Partners
320 West 13th St.
New York, NY 10014
Mr. Tim Hartung
212-807-7171

CONSTRUCTION MANAGER

LiRo Program & Construction Management
3 Aerial Way
Syosset, NY 11791
Mr. Eugene Bifulco
516-938-5476

OWNER

NYC-Dept Design & Construction
Santosh Chambran
718-381-1176

Completion Date

11/15/10

PROJECT & LOCATION

Train Washer @ Highbridge
100 Depot Place
Bronx, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$11,173,920.00

ARCHITECT

STV Inc.
225 Park Avenue So.
New York, NY 10003
Mr. Donald Harris
212-777-4400

OWNER RERERENCE & TEL #

Metro North Railroad

Andrew Igoe

718-293-0946

COMPLETION DATE

09/08

PROJECT & LOCATION

City College-School of Architecture

New York, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$10,957,075.00

ARCHITECT

Rafael Vinoly

50 Vandam St.

New York, NY 10013

Mr. Rafael Vinoly

212-924-5060

OWNER RERERENCE & TEL #

DASNY/Liro Group

Ralph Tilleli

212-368-9038

COMPLETION DATE

8/08

PROJECT & LOCATION

Jacobi Medical Center

1400 Pelham Parkway, Bronx, NY

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$18,699,751.00

ARCHITECT

Pei Cobb Freed Partners
88 Pine St.
New York, NY 10005
Mr. Ivan Kreitman
212-872-4058

OWNER REFERENCE & TEL #

DASNY/TDX Construction Corp.
Raymond Leu
718-409-1907

COMPLETION DATE

09/08

PROJECT & LOCATION

Multi Tenant Industrial Building @ Perry Avenue
Brooklyn, N.Y.

CONTRACT TYPE

General Construction

CONTRACT AMOUNT

\$8,071,313.00

ARCHITECT

Stantec Architects
50 W. 23rd St.
New York, NY 10010
Mr. James Nelson
212-366-5600

OWNER REFERENCE & TEL #

Brooklyn Navy Yard Development Corp./TDX
Prakash Shah
718-596-4181

COMPLETION DATE

09/08

Tax ID #: 13-2599516APT E-
PIN#: 85013B0106

Contract # 1 - General Construction Work

SCHEDULE B - M/WBE Utilization Plan**Part I: M/WBE Participation Goals**

Part I to be completed by contracting agency

Contract Overview

APT E-Pin # 85013B0106 FMS Project ID#: F175QUEEN

Project Title/Agency NEW EMS STATION 50

PIN # 8502013FI0003C

Bid/Proposal

Response Date: July 17, 2013

Contracting Agency Department of Design and Construction

Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101

Contact Person James A. Cerasoli Title Deputy Director

Telephone # (718) 391-1549 Email cerasoli@ddc.nyc.gov

Project Description (attach additional pages if necessary)

This Project consists of the construction of a new EMS Station at the Queens Hospital Campus for the FDNY. The building is a two story steel frame with concrete foundations on piles

M/WBE Participation Goals for Services

Enter the percentage amount for each group or for an unspecified goal.

Prime Contract Industry: Construction

Group	Percentage	
<u>Unspecified</u>	<u>10</u>	<u>%</u>
or		
Black American		%
Hispanic American		%
Asian American		%
Women		%
<u>Total Participation Goals</u>	<u>10</u>	<u>%</u>

Line 1

13-2599516

APT E-

Tax ID #

PIN#

85013B0106

SCHEDULE B - Part II: M/WBE Participation Plan

Part II to be completed by the bidder/proposer:

Please note: For Non-M/WBE Prime Contractors who will NOT subcontract any services and will self-perform the entire contract, you must obtain a FULL waiver by completing the Waiver Application on pages 9 and 9a and timely submitting it to the contracting agency pursuant to the Notice to Prospective Contractors. Once a FULL WAIVER is granted, it must be included with your bid or proposal and you do not have to complete or submit this form with your bid or proposal.

Section I: Prime Contractor Contact Information

Tax ID # 13-2599516 FMS Vendor ID # _____
 Business Name Calcedo Const. Corp. Contact Person Joseph C. Tomei
 Address 10 Midland Ave. Port Chester NY 10573
 Telephone # 914 935 0000 Email jct@calcedo.com

Section II: M/WBE Utilization Goal Calculation: Check the applicable box and complete subsection.**PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS**

☐ For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Agency M/WBE Participation Goals.

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total
Bid/Proposal
ValueAgency Total
Participation Goals
(Line 1, Page 1)Calculated M/WBE
Participation Amount

\$14,710,371

X

10%

=

\$1,471,037
Line 2**PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS**

☐ For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Modified M/WBE Participation Goals.

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total
Bid/Proposal
ValueAdjusted
Participation Goal
(From Partial Waiver)Calculated M/WBE
Participation Amount

\$

X

=

\$
Line 3

Section III: M/WBE Utilization Plan: How Proposer/Bidder Will Fulfill M/WBE Participation Goals. Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation. Check applicable box. The Proposer or Bidder will fulfill the M/WBE Participation Goals:

☐ As an M/WBE Prime Contractor that will self-perform and/or subcontract to other M/WBE firms a portion of the contract the value of which is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals. Please check all that apply to Prime Contractor:

☐ MBE ☐ WBE

☐ As a Qualified Joint Venture with an M/WBE partner, in which the value of the M/WBE partner's participation and/or the value of any work subcontracted to other M/WBE firms is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals.

☒ As a non M/WBE Prime Contractor that will enter into subcontracts with M/WBE firms the value of which is at least the amount located on Lines 2 or 3 above, as applicable.

Section IV: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status? % 60

Enter brief description of the type(s) and dollar value of subcontracts for all any services you plan on subcontracting if awarded this contract. For each item, indicate whether the work is designated for participation by MBEs and/or WBEs and the time frame in which such work is scheduled to begin and end. Use additional sheets if necessary.

1. To Be determined
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. SEE SUBC651D
10. See
11. See
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

✓ Scopes of Subcontract Work

Section V: Vendor Certification and Required Affirmations

I hereby:

- 1) acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York (Section 6-129), and the rules promulgated thereunder;
- 2) affirm that the information supplied in support of this M/WBE Utilization Plan is true and correct;
- 3) agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract
- 4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and
- 5) agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Signature Joseph C. Tomei
Print Name Joseph C. Tomei

Date 7/6/13
Title President

Fax ID #:

13-2599516

APT E-

PIN#:

85013B0106

Section III: M/WBE Utilization Plan: How Proposer/Bidder Will Fulfill M/WBE Participation Goals. Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation. Check applicable box. The Proposer or Bidder will fulfill the M/WBE Participation Goals:

☐ As an M/WBE Prime Contractor that will self-perform and/or subcontract to other M/WBE firms a portion of the contract the value of which is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals. Please check all that apply to Prime Contractor:

☐ MBE ☐ WBE

☐ As a Qualified Joint Venture with an M/WBE partner, in which the value of the M/WBE partner's participation and/or the value of any work subcontracted to other M/WBE firms is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals.

☒ As a non M/WBE Prime Contractor that will enter into subcontracts with M/WBE firms the value of which is at least the amount located on Lines 2 or 3 above, as applicable.

Section IV: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status? % 60 - 65%

Enter brief description of the type(s) and dollar value of subcontracts for all any services you plan on subcontracting if awarded this contract. For each item, indicate whether the work is designated for participation by MBEs and/or WBEs and the time frame in which such work is scheduled to begin and end. Use additional sheets if necessary.

Schedule to be deter. based on start date

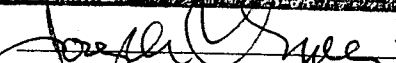
✓ Scopes of Subcontract Work	1. Ceramic Tile	MBE	133,350
	2. Electrical	WBE	1,089,000
	3. HVAC	MBE	778,600
	4. Sprinkler	MBE	70,000
	5. Concrete	Non-M/WBE	1,900,000
	6. Plumbing	Non-M/WBE	340,000
	7. Structural Steel	Non-M/WBE	1,300,000
	8. Glass & Glazing	Non-M/WBE	1,600,000
	9. Carpentry	Non-M/WBE	500,000
	10. Misc. Metal	Non-M/WBE	600,000
	11. Site Con. & Paving	Non-M/WBE	226,000
	12. Elevator	Non-M/WBE	105,000
	13. Site Drainage	Non-M/WBE	300,000
	14. Arch. Millwork	WBE	28,725
	⇒ 15. Hollow metal & Hardware	WBE	48,280
	16.		
	17.		

Section V: Vendor Certification and Required Affirmations

I hereby:

- 1) acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York (Section 6-129), and the rules promulgated thereunder;
- 2) affirm that the information supplied in support of this M/WBE Utilization Plan is true and correct;
- 3) agree, if awarded this Contract to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder; all of which shall be deemed to be material terms of this Contract;
- 4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and
- 5) agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Signature



Date

7/11/13

Print Name

Joseph C. Tomei

Title

President

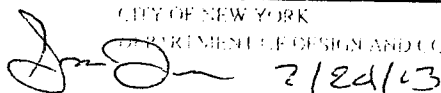
CITY OF NEW YORK

DEPARTMENT OF DESIGN AND CONSTRUCTION

8-R

BID BOOKLET

DELAY DAMAGES PILOT September 2008



BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

Project ID: F175QUEEN

SUBMISSION: In addition to its Bid (Bid Envelope # 1), the Bidder must, at the time of the bid, complete and submit this form in a separate, sealed envelope (Bid Envelope # 2). To complete this form, the Bidder must identify the subcontractors it intends to use for the work listed below, as well as the dollar amount to be paid to each subcontractor. Failure to complete this form and submit it in a separate, sealed envelope will result in the disqualification of the bid as non-responsive.

The Bidder intends to use the following subcontractors. If the Bidder intends to do any of the work referenced below with its own forces, the Bidder should complete this form using its own name. If multiple subcontractors for any trade are proposed, Bidder may submit multiple copies of this form.

1. **PLUMBING CONTRACTOR:**

130
MAR-SAL PLUMBING + HEATING INC
(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ 340,000

2. **HVAC CONTRACTOR:**

140
KLAIRGAR INC
(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ 630,000

3. **ELECTRICAL CONTRACTOR:**

150
EPOC ELECTRICAL
(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ 1,089,000

BIDDER'S SIGNATURE: The Bidder must sign this form in the space provided below:

Name of Bidder: Calcedo Const. Corp.

By: 
Signature of Partner or Corporate Officer

Print Name: Joseph C. Tomei

Title: President

BID BOND 1
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, Calcedo Construction Corp.
10 Midland Avenue, Port Chester, NY 10537

hereinafter referred to as the "Principal", and Fidelity & Deposit Company of
Maryland, 300 Interpace Parkway, Morris Corp. 1
Parsippany, NJ 07054

hereinafter referred to as the "Surety" are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "CITY", or to its successors and assigns in the penal sum of Ten (10%)

Percent of the total amount bid

(\$-----), Dollars lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the Principal is about to submit (or has submitted) to the City the accompanying proposal, hereby made a part hereof, to enter into a contract in writing for New EMS Station #50

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall not withdraw said Proposal without the consent of the City for a period of forty-five (45) days after the opening of bids and in the event of acceptance of the Principal's Proposal by the City, if the Principal shall:

(a) Within ten (10) days after notification by the City, execute in quadruplicate and deliver to the City all the executed counterparts of the Contract in the form set forth in the Contract Documents, in accordance with the proposal as accepted, and

(b) Furnish a performance bond and separate payment bond, as may be required by the City, for the faithful performance and proper fulfillment of such Contract, which bonds shall be satisfactory in all respects to the City and shall be executed by good and sufficient sureties, and

(c) In all respects perform the agreement created by the acceptance of said Proposal as provided in the Information for Bidders, bound herewith and made a part hereof, or if the City shall reject the aforesaid Proposal, then this obligation shall be null and void; otherwise to remain in full force and effect.

BID BOND 2

In the event that the Proposal of the Principal shall be accepted and the Contract be awarded to him the Surety hereunder agrees subject only to the payment by the Principal of the premium therefore, if requested by the City, to write the aforementioned performance and payment bonds in the form set forth in the Contract Documents.

It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

There shall be no liability under this bond if, in the event of the acceptance of the Principal's Proposal by the City, either a performance bond or payment bond, or both, shall not be required by the City on or before the 30th day after the date on which the City signs the Contract.

The surety, for the value received, hereby stipulates and agrees that the obligations of the Surety and its bond shall in no way be impaired or affected by any postponements of the date upon which the City will receive or open bids, or by any extensions of time within which the City may accept the Principal's Proposal, or by any waiver by the City of any of the requirements of the Information for Bidders, and the Surety hereby waives notice of any such postponements, extensions, or waivers.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the 9th day of July, 2013.

(Seal)

Calcedo Construction Corp.

(L.S.)

Principal

By:

Joseph C. Tomei-Pres.

(Seal)

Fidelity & Deposit Company of Maryland

Surety


By:

Theresa A. Lanfranco, Attorney-in-Fact

BID BOND 3

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of WEST ss:
On this 11th day of July, before me personally came
Joseph C. Tomei to me known, who, being by me duly sworn, did depose and say that he
resides at 21 Bishop Rd. Bedford NY
that he is the President of Calcedo Const. Corp.
the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the
directors of said corporation, and that he signed his name thereto by like order.


VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Notary Public, State of New York
Commission Expires Aug. 31, 2013

ACKNOWLEDGEMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:
On this _____ day of _____, before me personally appeared
_____ to me known and known to me to be one of the members of the firm of
_____ described in and who executed the foregoing instrument, and he
acknowledged to me that he executed the same as and for the act and deed of said firm.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:
On this _____ day of _____, before me personally appeared
_____ to me known and known to me to be the person described in and who
executed the foregoing instrument and acknowledged that he executed the same.

Notary Public

AFFIX ACKNOWLEDGEMENTS AND JUSTIFICATION OF SURETIES

Individual Acknowledgment

State of _____

County of _____

On this _____ day of _____, 20____, before me personally came _____ to me known, and known to me to be the individual in and who executed the foregoing instrument, and acknowledged to me that he/she executed the same.

My commission expires _____

Notary Public


Corporation Acknowledgment

State of NY

County of WEST

On the 11th day of July, before me personally came Joseph C. Tomei to me known; who being by me duly sworn, did depose and say that he/she/they reside(s) in 21 Bishop Rd. Bedford NY that he/she/they is (are) the Pres. of the Calcedo Const. Corp., the corporation described in and which executed the above instrument; that he/she/they know(s) the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by authority of the board of directors of said corporation, and that he/she/they signed his/her/their name(s) thereto by like authority.

My commission expires 8/31/13


VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2013
Notary Public

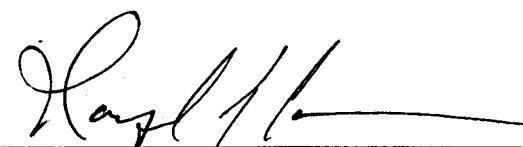
Surety Acknowledgment

State of New York

County of Nassau

On the 9th day of July, 2013 personally came Theresa A. Lanfranco to me known, who being by me duly sworn did depose and say that he/she is an Attorney-in-Fact of Fidelity and Deposit Company of Maryland in and which executed the above Instrument know(s) the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that he/she/they signed the said instrument and affixed the said seal as Attorney-in-fact by authority of the Board of Directors of said corporation and by authority of this office under the standing resolution thereof.

My commission expires _____


Notary Public
RAYMOND C. CARMAN
Notary Public, State of New York
No. 01CA5617975
Qualified in Nassau County
Commission Expires Jan. 31, 2015

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Raymond C. CARMAN, Theresa A. LANFRANCO, Dominick SCOTTO and Dorothy ELFAWAL, all of Uniondale, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 16th day of January, A.D. 2013.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By:

Eric D. Barnes

*Assistant Secretary
Eric D. Barnes*

Geoffrey Delisio

*Vice President
Geoffrey Delisio*

State of Maryland
City of Baltimore

On this 16th day of January, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and ERIC D. BARNES, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, depose and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski

*Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2015*



FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition

As Of December 31, 2011

ASSETS

Bonds	\$ 167,477,539
Stocks	23,576,974
Cash and Short Term Investments	235,580
Reinsurance Recoverable	12,886,175
Other Accounts Receivable	39,980,988
TOTAL ADMITTED ASSETS	\$ 244,157,256

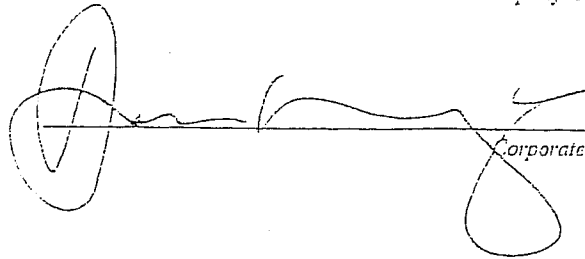
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses	\$ 127,987
Ceded Reinsurance Premiums Payable	48,215,682
Securities Lending Collateral Liability	1,022,500
TOTAL LIABILITIES	\$ 49,366,169
Capital Stock, Paid Up	\$ 5,000,000
Surplus	189,791,087
Surplus as regards Policyholders	194,791,087
TOTAL	\$ 244,157,256

Securities carried at \$59,049,993 in the above statement are deposited as required by law.

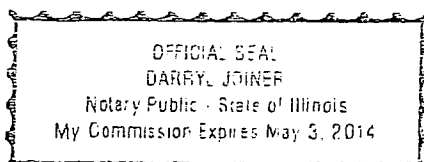
Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2011 market quotations for all bonds and stocks owned, the Company's total admitted assets would be \$253,778,028 and surplus as regards policyholders \$204,411,859.

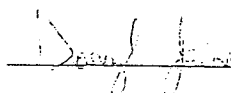
I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2011.


Corporate Secretary

State of Illinois }
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois in the City of Schaumburg this 15th day of March, 2012.




Notary Public

SAFETY QUESTIONNAIRE

The bidder must include, with its bid, all information requested on this Safety Questionnaire. Failure to provide a completed and signed Safety Questionnaire at the time of bid opening may result in disqualification of the bid as non-responsive.

1. Bidder Information:

Company Name: Calcedo Const. Corp.

DDC Project Number F175Queen

Company Size: ~~x~~ Ten (10) employees or less
 _____ Greater than ten (10) employees

X Company has previously worked for DDC

2. Type(s) of Construction Work

TYPE OF WORK	LAST 3 YEARS	THIS PROJECT
General Building Construction	X	X
Residential Building Construction		
Nonresidential Building Construction		
Heavy Construction, except building		
Highway and Street Construction		
Heavy Construction, except highways		
Plumbing, Heating, HVAC		
Painting and Paper Hanging		
Electrical Work		
Masonry, Stonework and Plastering		
Carpentry and Floor Work		
Roofing, Siding, and Sheet Metal		
Concrete Work		
Specialty Trade Contracting		
Asbestos Abatement		
Other (specify)		

3. Experience Modification Rate: See Attached

The Experience Modification Rate (EMR) is a rating generated by the National Council of Compensation Insurance (NCCI). This rating is used to determine the contractor's premium for worker's compensation insurance. The contractor may obtain its EMR by contacting its insurance broker or the NCCI. If the contractor cannot obtain its EMR, it must submit a written explanation as to why.

The Contractor must indicate its Intrastate and Interstate EMR for the past three years. [Note: For contractors with less than three years of experience, the EMR will be considered to be 1.00].

See Attached

YEAR	INTRASTATE RATE	INTERSTATE RATE
4/12-4/13	.89	N/A
4/11-4/12	.88	N/A
4/10-4/11	.90	N/A

If the Intrastate and/or Interstate EMR for any of the past three years is greater than 1.00, the contractor must attach, to this questionnaire, a written explanation for the rating and identify what corrective action was taken to correct the situation resulting in that rating.

4. OSHA Information:

No

Contractor has received a willful violation issued by OSHA or New York City Department of Buildings (NYCDOB) within the last three years.

No

Contractor has had an incident requiring OSHA notification within 8 hours (i.e., fatality, or hospitalization of three or more employees).

The Occupational Safety and Health Act (OSHA) of 1970 requires employers with ten or more employees, on a yearly basis to complete and maintain on file the form entitled "Log of Work-related Injuries and Illnesses". This form is commonly referred to as the OSHA 300 Log (OSHA 200 Log for 2001 and earlier).

The OSHA 300 Log must be submitted for the last three years for contractors with more than ten employees.

The Contractor must indicate the total number of hours worked by its employees, as reflected in payroll records for the past three years.

The contractor must submit the Incident Rate for Lost Time Injuries (the Incident Rate) for the past three years. The Incident Rate is calculated in accordance with the formula set forth below. For each given year, the total number of incidents is the total number of non-fatal injuries and illnesses reported on the OSHA 300 Log. The 200,000 hours represents the equivalent of 100 employees working forty hours a week, fifty weeks per year.

$$\text{Incident Rate} = \frac{\text{Total Number of Incidents} \times 200,000}{\text{Total Number of Hours Worked by Employees}}$$

YEAR	TOTAL NUMBERS OF HOURS WORKED BY EMPLOYEES	INCIDENT RATE	See Attached
2012	24,360	0	
2011	25,454	0	
2010	24,772	0	

If the contractor's Incident Rate for any of the past three years is one point higher than the Incident Rate for the type of construction it performs (listed below), the contractor must attach, to this questionnaire, a written explanation for the relatively high rate.

General Building Construction	8.5
Residential Building Construction	7.0
Nonresidential Building Construction	10.2
Heavy Construction, except building	8.7
Highway and Street Construction	9.7
Heavy Construction, except highways	8.3
Plumbing, Heating, HVAC	11.3
Painting and Paper Hanging	6.9
Electrical Work	9.5
Masonry, Stonework and Plastering	10.5
Carpentry and Floor Work	12.2
Roofing, Siding, and Sheet Metal	10.3
Concrete Work	8.6
Specialty Trade Contracting	8.6

5. Safety Performance on Previous DDC Project(s)

No Contractor previously audited by the DDC Office of Site Safety.

DDC Project Number(s): _____

No Accident on previous DDC Project(s).

No Fatality or Life-altering Injury on DDC Project(s) within the last three years.
[Examples of a life-altering injury include loss of limb, loss of a sense (e.g., sight, hearing), or loss of neurological function].

Date:

7/11/13

By:


(Signature of Owner, Partner, Corporate Officer)

Title:

Pres.

VENDEX COMPLIANCE

(A) **Vendex Fees:** Pursuant to Procurement Policy Board Rule 2-08(f)(2), the contractor will be charged a fee for the administration of the VENDEX system, including the Vendor Name Check process, if a Vendor Name Check review is required to be conducted by the Department of Investigation. The contractor shall also be required to pay the applicable required fees for any of its subcontractors for which Vendor Name Check reviews are required. The fee(s) will be deducted from payments made to the contractor under the contract. For contracts with an estimated value of less than or equal to \$1,000,000, the fee will be \$175 per Vendor Name Check review. For contracts with an estimated value of greater than \$1,000,000, the fee will be \$350 per Vendor Name Check review.

(B) **Confirmation of Vendex Compliance:** The Bidder shall submit this Confirmation of Vendex Compliance to the Department of Design and Construction, Contracts Section, 30-30 Thomson Avenue – First Floor, Long Island City, NY 11101.

Bid Information: The Bidder shall complete the bid information set forth below.

Name of Bidder: Calcedo Const. Corp.
Bidder's Address: 10 Midland Ave. 1Port Chester NY 10573
Bidder's Telephone Number: 914 935 0000
Bidder's Fax Number: 914 935 0385
Date of Bid Opening: 7/9/13
Project ID: F175QUEEN

Vendex Compliance: To demonstrate compliance with Vendex requirements, the Bidder shall complete either Section (1) or Section (2) below, whichever applies.


- (1) **Submission of Vendex Questionnaires to MOCS:** By signing in the space provided below, the Bidder certifies that as of the date specified below, the Bidder has submitted Vendex Questionnaires to the Mayor's Office of Contract Services, Attn: VENDEX, 253 Broadway, 9th Floor, New York, New York 10007.

Date of Submission: _____

By: _____
(Signature of Partner or corporate officer)

Print Name: _____

- (2) **Submission of Certification of No Change to DDC:** By signing in the space provided below, the Bidder certifies that it has read the instructions in a "Vendor's Guide to Vendex" and that such instructions do not require the Bidder to submit Vendex Questionnaires. The Bidder has completed **TWO ORIGINALS** of the Certification of No Change set forth on the next page of this Bid Booklet.

By:  _____
(Signature of Partner or corporate officer)

Print Name: Joseph C. Tomei

Certificate of No Change Form



- Please submit two completed forms. Copies will not be accepted.
- Please send both copies to the agency that requested it, unless you are advised to send it directly to the Mayor's Office of Contract Services (MOCS).
- A materially false statement willfully or fraudulently made in connection with this certification, and/or the failure to conduct appropriate due diligence in verifying the information that is the subject of this certification, may result in rendering the submitting entity non-responsible for the purpose of contract award.
- A materially false statement willfully or fraudulently made in connection with this certification may subject the person making the false statement to criminal charges

I, Joseph C. Tomei, being duly sworn, state that I have read
Enter Your Name

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

In addition, I further certify on behalf of the submitting vendor that the information contained in the principal questionnaire(s) and any submission of change identified on page two of this form have not changed and have been verified and continue, to the best of my knowledge, to be full, complete and accurate.

I understand that the City of New York will rely on the information supplied in this certification as additional inducement to enter into a contract with the submitting entity.

Vendor Questionnaire *This section is required.*

This refers to the vendor questionnaire(s) submitted for the vendor doing business with the City.

Name of Submitting Entity: Calcedo Const. Corp.

Vendor's Address: 10 Midland Ave. Port Chester NY 10573

Vendor's EIN or TIN: 13-2599516 Requesting Agency: DDC

Are you submitting this Certification as a parent? (Please circle one) Yes No

Signature date on the last full vendor questionnaire signed for the submitting vendor: 9/12/10

Signature date on change submission for the submitting vendor: 7/9/13

Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.



Mayor's Office of
Contract Services

	Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on submission of change
1	Joseph C. Tomei	9/10/12	7/9/13
2	Joseph M. Tomei	9/10/12	7/9/13
3	Evelyn Tomei	9/10/12	7/9/13
4			
5			
6			

☐ Check if additional changes were submitted and attach a document with the date of additional submissions.

Certification This section is required.

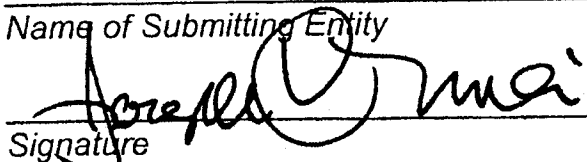
This form must be signed and notarized. Please complete this twice. Copies will not be accepted.

Certified By:

Joseph C. Tomei
Name (Print)

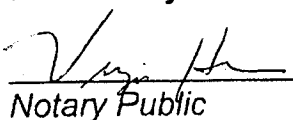
President
Title

Calcedo Const. Corp.
Name of Submitting Entity


Signature

7/11/13
Date

Notarized By:


Notary Public

West
County License Issued

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2013

License Number

Sworn to before me on: 7/11/13
Date

The City of New York Department of Small Business Services
Division of Labor Services Contract Compliance Unit
110 William Street, New York, New York 10038
Phone: (212) 513 - 6323
Fax: (212) 618-8879

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

1. Your contractual relationship in this contract is: Prime contractor ☒ Subcontractor ☐
- 1a. Are MWBE goals attached to this project? Yes ☒ No ☐
2. Please check one of the following if your firm would like information on how to certify with the City of New York as a:
☐ Minority Owned Business Enterprise ☐ Locally based Business Enterprise
☐ Women Owned Business Enterprise ☐ Emerging Business Enterprise
- 2a. If you are certified as an MBE, WBE, or LBE, what city/state agency are you certified with? N/A
Are you DBE certified? Yes ☐ No ☐
3. Please indicate if you would like assistance from SBS in identifying certified MWBEs for contracting opportunities: Yes ☐ No ☒
4. Is this project subject to a project labor agreement? Yes ☒ No ☐

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

5. 13-2599516 jct@calcedo.com
Employer Identification Number or Federal Tax I.D./ Email Address
6. Calcedo Construction Corp.
Company Name
7. 20 Midland Ave/ Port Chester NY/10573
Company Address and Zip Code
8. Joseph C. Tomei 914 935 0000
Chief Operating Officer Telephone Number
9. Joseph C. Tomei 914 935 0000
Designated Equal Opportunity Compliance Officer Telephone Number
(If same as Item #7, write "same")
10. SAME
Name of Prime Contractor and Contact Person
(If same as Item #5, write "same")
11. Number of employees in your company: 10

12. Contract information:

- (a) DDC
Contracting Agency (City Agency)
- (b) _____
Contract Amount
- (d) F175 Queens
Procurement Identification Number (PIN)
- (e) _____
Contract Registration Number (CT#)
- (f) _____
Projected Commencement Date
- (g) _____
Projected Completion Date
- (h) Description and location of proposed contract:
New EMS Station 50

13. Has your firm been reviewed by the Division of Labor Services (DLS) within the past 36 months and issued a Certificate of Approval? Yes ___ No ☒

If yes, attach a copy of certificate.

14. Has DLS within the past month reviewed an Employment Report submission for your company and issued a Conditional Certificate of Approval? Yes ___ No ☒

If yes, attach a copy of certificate.

NOTE: DLS WILL NOT ISSUE A CONTINUED CERTIFICATE OF APPROVAL IN CONNECTION WITH THIS CONTRACT UNLESS THE REQUIRED CORRECTIVE ACTIONS IN PRIOR CONDITIONAL CERTIFICATES OF APPROVAL HAVE BEEN TAKEN.

15. Has an Employment Report already been submitted for a different contract (not covered by this Employment Report) for which you have not yet received compliance certificate?
Yes ___ No ☒ If yes,

Date submitted: _____
Agency to which submitted: _____
Name of Agency Person: _____
Contract No: _____
Telephone: _____

16. Has your company in the past 36 months been audited by the United States Department of Labor, Office of Federal Contract Compliance Programs (OFCCP)? Yes ___ No ☒

If yes,

- (a) Name and address of OFCCP office.

- (b) Was a Certificate of Equal Employment Compliance issued within the past 36 months?
Yes ___ No ☒

If yes, attach a copy of such certificate.

- (c) Were any corrective actions required or agreed to? Yes___ No ☒

If yes, attach a copy of such requirements or agreements.

- (d) Were any deficiencies found? Yes___ No ☒

If yes, attach a copy of such findings.

17. Is your company or its affiliates a member or members of an employers' trade association which is responsible for negotiating collective bargaining agreements (CBA) which affect construction site hiring? Yes___ No___

If yes, attach a list of such associations and all applicable CBA's.

PART II: DOCUMENTS REQUIRED

18. For the following policies or practices, attach the relevant documents (e.g., printed booklets, brochures, manuals, memoranda, etc.). If the policy(ies) are unwritten, attach a full explanation of the practices. See instructions.

☒ (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)

☒ (b) Disability, life, other insurance coverage/description

☒ (c) Employee Policy/Handbook

☒ (d) Personnel Policy/Manual

☒ (e) Supervisor's Policy/Manual

☒ (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered

☒ (g) Collective bargaining agreement(s).

☒ (h) Employment Application(s)

☒ (i) Employee evaluation policy/form(s).

☒ (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?

19. To comply with the Immigration Reform and Control Act of 1986 when and of whom does your firm require the completion of an I-9 Form?

- | | | |
|--|---|--|
| (a) Prior to job offer | Yes___ | No <input checked="" type="checkbox"/> |
| (b) After a conditional job offer | Yes___ | No <input checked="" type="checkbox"/> |
| (c) After a job offer | Yes___ | No <input checked="" type="checkbox"/> |
| (d) Within the first three days on the job | Yes <input checked="" type="checkbox"/> | No___ |
| (e) To some applicants | Yes___ | No <input checked="" type="checkbox"/> |
| (f) To all applicants | Yes <input checked="" type="checkbox"/> | No___ |
| (g) To some employees | Yes___ | No <input checked="" type="checkbox"/> |
| (h) To all employees | Yes <input checked="" type="checkbox"/> | No___ |

20. Explain where and how completed I-9 Forms, with their supportive documentation, are maintained and made accessible.

In a separate file maintained in Comptroller's office.

21. Does your firm or any of its collective bargaining agreements require job applicants to take a medical examination? Yes___ No ☒

If yes, is the medical examination given:

- | | |
|-----------------------------------|--------------|
| (a) Prior to a job offer | Yes___ No___ |
| (b) After a conditional job offer | Yes___ No___ |
| (c) After a job offer | Yes___ No___ |
| (d) To all applicants | Yes___ No___ |
| (e) Only to some applicants | Yes___ No___ |

If yes, list for which applicants below and attach copies of all medical examination or questionnaire forms and instructions utilized for these examinations.

22. Do you have a written equal employment opportunity (EEO) policy? Yes___ No ☒

If yes, list the document(s) and page number(s) where these written policies are located.

23. Does the company have a current affirmative action plan(s) (AAP) No
- ___ Minorities and Women
- ___ Individuals with handicaps
- ___ Other. Please specify _____

24. Does your firm or collective bargaining agreement(s) have an internal grievance procedure with respect to EEO complaints? Yes ☒ No___

If yes, please attach a copy of this policy.

If no, attach a report detailing your firm's unwritten procedure for handling EEO complaints.

25. Has any employee, within the past three years, filed a complaint pursuant to an internal grievance procedure or with any official of your firm with respect to equal employment opportunity? Yes___ No ☒

If yes, attach an internal complaint log. See instructions.

26. Has your firm, within the past three years, been named as a defendant (or respondent) in any administrative or judicial action where the complainant (plaintiff) alleged violation of any anti-discrimination or affirmative action laws? Yes___ No ☒

If yes, attach a log. See instructions.

27. Are there any jobs for which there are physical qualifications? Yes___ No ☒

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

28. Are there any jobs for which there are age, race, color, national origin, sex, creed, disability, marital status, sexual orientation, or citizenship qualifications? Yes___ No ☒

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

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SIGNATURE PAGE

I, (print name of authorized official signing) Joseph C. Tomei hereby certify that the information submitted herewith is true and complete to the best of my knowledge and belief and submitted with the understanding that compliance with New York City's equal employment requirements, as contained in Chapter 56 of the City Charter, Executive Order No. 50 (1980), as amended, and the implementing Rules and Regulations, is a contractual obligation.

I also agree on behalf of the company to submit a certified copy of payroll records to the Division of Labor Services on a monthly basis.

Calcedo Construction Corp.

Contractor's Name

Joseph C. Tomei

President

Name of person who prepared this Employment Report

Title

SAME

SAME

Name of official authorized to sign on behalf of the contractor

Title

914 935 0000

Telephone Number

Joseph C. Tomei
Signature of authorized official

7/11/13
Date

If contractors are found to be underutilizing minorities and females in any given trade based on Chapter 56 Section 3H, the Division of Labor Services reserves the right to request the contractor's workforce data and to implement an employment program.

Contractors who fail to comply with the above mentioned requirements or are found to be in noncompliance may be subject to the withholding of final payment.

Willful or fraudulent falsifications of any data or information submitted herewith may result in the termination of the contract between the City and the bidder or contractor and in disapproval of future contracts for a period of up to five years. Further, such falsification may result in civil and/or criminal prosecution.

To the extent permitted by law and consistent with the proper discharge of DLS' responsibilities under Charter Chapter 56 of the City Charter and Executive Order No. 50 (1980) and the implementing Rules and Regulations, all information provided by a contractor to DLS shall be confidential.

Only original signatures accepted.

Sworn to before me this 11th day of July 20 13

Virginia Hardman
Notary Public

Joseph C. Tomei
Authorized Signature

7/11/13
Date

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2014

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**BIDDER'S CERTIFICATION OF COMPLIANCE WITH
IRAN DIVESTMENT ACT**

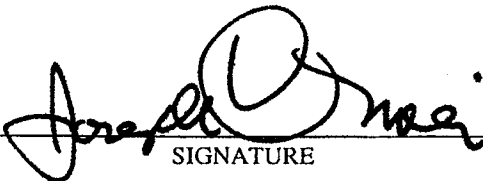
Pursuant to General Municipal Law §103-g, which generally prohibits the City from entering into contracts with persons engaged in investment activities in the energy sector of Iran, the bidder/proposer submits the following certification:

[Please Check One]

BIDDER'S CERTIFICATION

- ☒ By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief, that each bidder/proposer is not on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law.
- ☐ I am unable to certify that my name and the name of the bidder/proposer does not appear on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. I have attached a signed statement setting forth in detail why I cannot so certify.

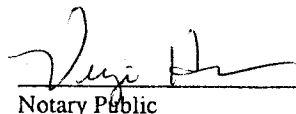
Dated: Westchester, New York
7/11, 20 13


SIGNATURE

Joseph C. Tomei
PRINTED NAME

President
TITLE

Sworn to before me this
11 day of July, 20 13


Notary Public

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 20 16

Dated: 7/11/13

Project Labor Agreement - - Letter of Assent

The undersigned party confirms that it agrees to be a party to and be bound by the Project Labor Agreement Covering construction of an Emergency Medical Station to be built on vacant land on the Queens Hospital Campus, known as the Queens Hospital EMS Station, as such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Project Labor Agreement, its Schedules, Addenda and Exhibits are hereby incorporated by reference herein.

The undersigned, as a Contractor or Subcontractor (hereinafter Contractor) on the Project known as: Queens Hospital EMS Station and located at Queens Hospital, 159-10 Goethals Avenue, Jamaica, New York 11432 (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECT, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

- (1) Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all schedules; amendments and supplements now existing or which are later made thereto.
- (2) Agrees to be bound by the legally established collective bargaining agreements and local trust agreements as set forth in the Project Labor Agreement and this Agreement but only to the extent of Project Work and as required by the PLA.
- (3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor but only to the extent of Project Work as required by the PLA.
- (4) Certifies that it has no commitments or agreements that would preclude its full and complete compliance with the terms and conditions of said Agreement. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it has engaged or may engage to work on the Project. Labor harmony disputes/issues shall be subject to the Labor Management Committee provisions.
- (5) Agrees to secure from any Contractor(s) (as defined in said Agreement) which is or becomes a Subcontractor (of any tier), to it, a duly executed Agreement to be Bound in from identical to this document.

Provide description of work; identify craft jurisdiction(s) and all contract numbers below:

New EMS Station 50, F175QUEEN
Pin# 8502013F10003C
General Contractor

Name of Contractor or subcontractor: Calcedo Construction Corp.

Authorized Officer & Title: Joseph M. Tomei, Vice President

Address: 10 Midland Avenue, Port Chester, NY 10573

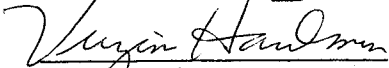
Phone: 914 935-0000 Fax: 914 935-0385

Contractors State License #: _____

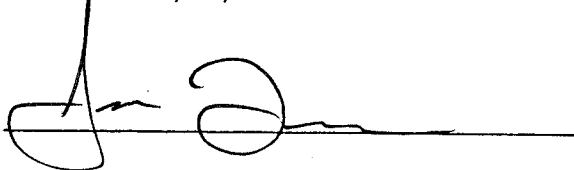
Entity your company is contracted with and address: Dept. of Design and Construction

Sworn to before me this

20th day of Aug.
2013


Notary Public

Dated: 8/20/13



Execution Copy 3.11.13

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4834895
Qualified in Westchester County
Commission Expires Aug. 31, 2012

NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL

STANDARDS OF EXCELLENCE

The purpose of this Standard of Excellence is to reinforce the pride of every construction worker and the commitment to be the most skilled, most productive and safest workforce available to construction employers and users in the City of New York. It is the commitment of every affiliated local union to use our training and skills to produce the highest quality work and to exercise safe and productive work practices.

The rank and file members represented by the affiliated local unions acknowledge and adopt the following standards:

- *Provide a full days work for a full days pay;*
- *Safely work towards the timely completion of the job;*
- *Arrive to work on time and work until the contractual quitting time;*
- *Adhere to contractual lunch and break times;*
- *Promote a drug and alcohol free work site;*
- *Work in accordance with all applicable safety rules and procedures;*
- *Allow union representatives to handle job site disputes and grievances without resort to slowdowns, or unlawful job disruptions;*
- *Respect management directives that are safe, reasonable and legitimate;*
- *Respect the rights of co-workers;*
- *Respect the property rights of the owner, management and contractors.*

The Unions affiliated with the New York City Building and Construction Trades Council will expect the signatory contractors to safely and efficiently manage their jobs and the unions see this as a corresponding obligation of the contractors under this Standard of Excellence. The affiliated unions will expect the following from its signatory contractors:

- *Management adherence to the collective bargaining agreements;*
- *Communication and cooperation with the trade foremen and stewards;*
- *Efficient, safe and sanitary management of the job site;*
- *Efficient job scheduling to mitigate and minimize unproductive time;*
- *Efficient and adequate staffing by properly trained employees by trade;*
- *Efficient delivery schedules and availability of equipment and tools to ensure efficient job progress;*
- *Ensure proper blueprints, specifications and layout instructions and material are available in a timely manner*
- *Promote job site dispute resolution and leadership skills to mitigate such disputes;*
- *Treatment of all employees in a respectful and dignified manner acknowledging their contributions to a successful project.*

The affiliated unions and their signatory contractors shall ensure that both the rank and file members and the management staff shall be properly trained in the obligations undertaken in the Standards of Excellence.

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

July 1, 2013

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**F175QUEEN
NEW QUEENS EMS STATION 50**

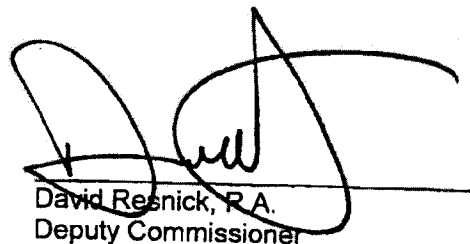
This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **The Bid Opening for the contract described below scheduled for July 9, 2013, at 2:00 pm is rescheduled to July 17, at 2:00 pm.**
Contract #1 – General Construction Work
2. **Questions from Bidders and Responses to Questions:**
See Attachment A.
4. **Revisions to Specifications**
See Attachment B.
5. **Revisions to Drawings:**
See Attachment C.
6. **Revisions to Bid Booklet:**
See Attachment D.
7. **Revisions to Volume 2:**
See Attachment E.

THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-2200, (718) 391-1727, or by fax at (718) 391-2615.


David Resnick, P.A.
Deputy Commissioner

Calcedo Const Corp

Name of Bidder

By:  7-2-13

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

July 9, 2013

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**F175QUEEN
NEW QUEENS EMS STATION 50**

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. Questions from Bidders and Responses to Questions:

See Attachment A.

2. Revisions to Bid Booklet:

See Attachment B.

3. Revisions to Specifications:

See Attachment C.

2. Revisions to Drawings:

See Attachment D.

Robert M. Lecha

THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-2200, (718) 391-1727, or by fax at (718) 391-2615.

David Resnick
David Resnick, R.A.
Deputy Commissioner

CHC Const Comp
Name of Bidder

By: *R. M. Lecha*

7-10-13

NOTICE TO BIDDERS:

- **PROJECT LABOR AGREEMENT:** This contract is subject to a Project Labor Agreement (“PLA”) entered into between the City and the Building and Construction Trades Council of Greater New York (“BCTC”) affiliated Local Unions. By submitting a bid, the Contractor agrees that the PLA is binding on the Contractor and all subcontractors of all tiers. The bidder to be awarded the contract will be required to execute a “Letter of Assent” prior to award.

The Bidder is advised to review the following: (1) Notice regarding the PLA, (2) the PLA, and (3) the Letter of Assent, all of which are set forth at the beginning of Volume 2 of the Contract Documents.

- **SINGLE CONTRACT:** As stated above, this contract is subject to a PLA. The requirements of the Wicks Law for separate prime contractors DO NOT APPLY to any project that is covered by a PLA. Accordingly, the requirements of the Wicks Law for separate prime contractors do not apply to this Project. The Project consists of a single contract, the Contract for General Construction Work.

The Bidder is advised to review the Notice set forth at the beginning of Volume 2 of the Contract Documents. The Notice specifies revisions to the Contract Documents to provide that the Project consists of a single contract and to delete any and all references to separate prime contractors.

SPECIAL NOTICE TO BIDDERS

The New York City Department of Small Business Services (SBS), in conjunction with the New York Business Development Corporation (NYBDC), have established a NYC Construction Loan pilot program to provide prime contractors and subcontractors financing for mobilization costs on certain City construction projects.

Under this initiative, loans are available for early stage mobilization needs such as insurance, labor, supplies and equipment. Bidders are strongly encouraged to visit "Growing Your Business" at www.nyc.gov/nycbusiness to learn more about the loan or contact constructionloan@sbs.nyc.gov / (212) 513-6444 to obtain details and to determine preliminary eligibility.

A successful loan applicant will be required to make an assignment of its contract (or subcontract) payments to the lender NYBDC until the loan is repaid. If the loan is to a subcontractor, a prime contractor must honor the terms of such an assignment.

A prime contractor may not discriminate against a subcontractor or potential subcontractor by reason of the subcontractor's participation, or nonparticipation, in the NYC Construction Loan program.

**CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES**

SPECIAL NOTICE TO BIDDERS

BID SUBMISSION REQUIREMENTS

**THE BID SHALL CONSIST OF TWO (2) SEPARATE, SEALED
ENVELOPES. THE DOCUMENTS THAT MUST BE COMPLETED AND
INCLUDED IN EACH SEPARATE ENVELOPE ARE LISTED BELOW.**

BID ENVELOPE #1: Bid Envelope #1 shall contain the following items:

- Bid Form, including Affirmation
- Bid Security (if required, see page 22)
- MWBE Subcontractor Utilization Plan (if participation goals have been established)

BID ENVELOPE #2: Bid Envelope #2 shall contain **ONLY** the following item:

- Bidder's Identification of Subcontractors (see pages 16 & 17)

**FAILURE TO SUBMIT THE FOUR ITEMS LISTED ABOVE
WILL RESULT IN THE DISQUALIFICATION OF THE BID**

BID ENVELOPE #1: In addition to the items listed above, Bid Envelope #1 shall also contain the following items: DO NOT Include the items listed below in Bid Envelope #2.

- Bid Breakdown (if required, see page 21)
- Safety Questionnaire
- Construction Employment Report (if bid is \$1,000,000 or more)
- Contract Certificate (if bid is less than \$1,000,000)
- Confirmation of Vendex Compliance
- Bidder's Certification of Compliance with Iran Divestment Act
- Special Experience Requirements Qualification Form (if required, see pages 3, 4)

**FAILURE TO SUBMIT THE SEVEN ITEMS LISTED ABOVE
MAY RESULT IN THE DISQUALIFICATION OF THE BID.**

- NOTES:**
- (1) All of the above referred to blank forms to be completed and submitted with the bid are included in the BID BOOKLET.
 - (2) If additional information is required, please contact DDC at 718-391-2601.
 - (3) **VENDEX QUESTIONNAIRES:** Vendex Questionnaires, as well as detailed instructions, may be obtained at www.nyc.gov/vendex. The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.
 - (4) **SPECIAL EXPERIENCE REQUIREMENTS:** The Bidder is advised that Special Experience Requirements may apply to this contract. Such requirements are set forth on pages 3 and 4 of this Bid Booklet.
 - (5) **SPECIAL EXPERIENCE REQUIREMENTS FOR ASBESTOS:** The Bidder is advised that this contract contains strict requirements regarding the prior experience and licensing of the subcontractor who will perform any required asbestos abatement work. These special experience requirements are set forth in the section of the specifications which describes any required asbestos abatement work.

PROJECT ID: F175QUEEN
CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

BID BOOKLET

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SPECIAL EXPERIENCE REQUIREMENTS

Special Experience Requirements apply as indicated below.

Bidder:	General Construction	<u> X </u> YES	<u> </u> NO
Specific Areas of Work:	General Construction	<u> X </u> YES	<u> </u> NO

(A) **EXPERIENCE REQUIREMENTS FOR THE BIDDER:** The special experience requirements set forth below apply to the bidder indicated above. Compliance with such special experience requirements will be determined solely by the City prior to an award of contract. Failure to comply with the special experience requirements will result in the rejection of the bid as non-responsive.

- The bidder must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

(B) **QUALIFICATION FORM:** For each project submitted to demonstrate compliance with the special experience requirements, the bidder must complete the Qualification Form included in the Bid Booklet. The City will only evaluate a project if the following criteria are met: (1) the project is described on the Qualification Form, and (2) all information on the Qualification Form is provided. The City will not evaluate any project which does not comply with the criteria set forth herein, including any project which is referred to only on the resume of an individual.

(C) **CONDITIONS:** The City may, in determining compliance with the special experience requirements set forth above, consider prior projects completed by principal(s) or other employees of the bidder while affiliated with another entity, subject to the conditions set forth below.

- Any principal or other employee on whose prior experience the bidder is relying to demonstrate compliance with this special experience requirement must have held the following: (a) a significant management role in the prior entity with which he/she was affiliated, and (b) a significant management role in the entity submitting the bid for a period of six months or from the inception of the bidding entity. If the bidder is relying on the prior experience of a principal or employee, it must submit documentation confirming the position held by such principal or employee in the prior entity, as well as in the bidding entity.
- The bidder may not rely on the experience of its principals or other employees to demonstrate compliance with any other requirements, including without limitation, financial requirements or requirements for a specified minimum amount of annual gross revenues.

(D) **JOINT VENTURES:** In the event the bidder is a joint venture, at least one firm in the joint venture must meet the above described experience requirements.

(E) **EXPERIENCE REQUIREMENTS FOR SPECIFIC AREAS OF WORK:** The special experience requirements set forth below apply to the contractor or subcontractor that will perform specific areas of work. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of such award, the contractor will be required to submit the qualifications of the contractor or subcontractor that will perform these specific areas of work. If the bidder intends to perform these specific areas of work with its own forces, it must demonstrate compliance with the special experience requirements. If the bidder intends to subcontract these specific areas of work, its proposed subcontractor(s) must demonstrate compliance with the special experience requirements. Once approved, no substitution will be permitted, unless the qualifications of the proposed replacement have been approved in writing in advance by the City. The bidder is advised to carefully review these special experience requirements prior to submitting its bid, as such experience requirements will be strictly enforced.

- (1) Special experience requirements apply to the contractor or subcontractor that will perform specific areas

of work specified in the section(s) set forth below.

General Construction

- Section 084413: Structural Sealant Glazed Curtain Walls
 - Section 075419: Polyvinyl-Chloride (PVC) Roofing
- (2) Special experience requirements applicable to the contractor or subcontractor that will perform specific areas of work are summarized below. Such experience requirements are set forth in full in the Addendum to the General Conditions.
- The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. In addition, for roofing work, the contractor or subcontractor must be licensed or approved by the manufacturer of the roofing system.
- (3) For each project submitted to demonstrate compliance with the special experience requirements for specific areas of work, the contractor or proposed subcontractor will be required to complete the Qualification Form included in the Bid Booklet. The City will only evaluate a project if the following criteria are met: (1) the project is described on the Qualification Form, and (2) all information on the Qualification Form is provided. The City will not evaluate any project which does not comply with the criteria set forth herein, including any project which is referred to only on the resume of an individual.

Qualification Form

Project ID: F175QUEEN

List previous projects completed to meet the special experience requirements for this contract. Please photocopy this form for submission of all required projects.

Name of Contractor: _____

Name of Project: _____

Location of Project: _____

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: _____

Title: _____ Phone Number: _____

Brief description of work completed: _____

Was the work performed as a prime or a subcontractor: _____

Amount of Contract: _____

Date of Completion: _____

Name of Contractor: _____

Name of Project: _____

Location of Project: _____

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: _____

Title: _____ Phone Number: _____

Brief description of work completed: _____

Was the work performed as a prime or a subcontractor: _____

Amount of Contract: _____

Date of Completion: _____

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Special Notice to Bidders – Proprietary Items

- A. General: A proprietary item required for the Project is specified below. The contractor is required to provide and install such proprietary item. The Contractor must provide the specified item from the designated manufacturer. Substitutions are not permissible and will not be approved. More detailed information regarding the item is set forth in the Specifications. Such information includes item description, as well as requirements for installation and related materials.
- B. Payment: For the required proprietary item, an allowance amount is indicated. The allowance provides a stipulated amount to reimburse the Contractor for the purchase of the proprietary item from the designated manufacturer. Payment from the allowance shall be limited to the purchase price of the specified proprietary item and shall exclude any costs above and beyond the purchase price. Payment from the allowance shall not include any of the following costs with respect to the specified proprietary item: (1) any mark-up for the Contractor's overhead and profit, (2) any costs for transportation, including delivery, shipping or special handling costs, (3) any costs for installation, and (4) any costs for related materials. Payment for the specified proprietary item shall be based on the invoice actually provided by the manufacturer.
- C. Bid Form: A total allowance amount for the purchase of all required proprietary items is set forth on the Bid Form. In preparing the lump sum portion of its bid, the Contractor shall:
- (1) Exclude from its bid any costs for the purchase of the proprietary items, and
 - (2) Include in its bid any costs above and beyond the purchase price, including without limitation, costs for transportation, delivery, installation, related materials and overhead.
- D. Required Proprietary Item(s):

CONTRACT NO. 1:

- | | |
|------------------------|---|
| 1. Proprietary Item: | Nederman Vehicle Exhaust System |
| Specification Section: | 233516 |
| Manufacturer: | Nederman MagnaTrack, MagnaRail and components |
| Allowance Amount: | Not to Exceed \$ 148,690.00 |
| | |
| 2. Proprietary Item: | Fimbel Overhead Door System |
| Specification Section: | 083600 |
| Manufacturer: | Fimbel |
| Allowance Amount: | Not to Exceed \$ 158,000.00 |

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MWBE PROGRAM

SUBCONTRACTOR UTILIZATION PLAN

Schedule B: Subcontractor Utilization Plan: Schedule B: Subcontractor Utilization Plan for this Contract is set forth on the following pages of this Bid Booklet. Schedule B: Subcontractor Utilization Plan (Part I) indicates whether participation goals have been established for this Contract. If participation goals have been established for this Contract, the bidder must submit Schedule B: Subcontractor Utilization Plan (Part II) with its bid.

Contract Provisions: Contract provisions regarding the participation of the MWBE firms are set forth in Article 77 of the Contract. The bidder is advised to review these contract provisions.

Waiver: The bidder may seek a full or partial pre-award waiver of the Target Subcontracting Percentage in accordance with Article 77 of the Contract (See Part A, Section 10). The bidder's request for a waiver must be submitted at least seven (7) calendar days prior to the bid date. Waiver requests submitted after the deadline will not be considered. The form for requesting a waiver of the Target Subcontracting Percentage is set forth in Schedule B: Subcontractor Utilization Plan (Part III).

Rejection of the Bid: The bidder must complete Schedule B: Subcontractor Utilization Plan (Part II) set forth on the following pages. Subcontractor Utilization Plans which do not include the required affirmations (on Page 2) will be deemed to be non-responsive, unless a full waiver of the Target Subcontracting Percentage is granted (Schedule B: Subcontractor Utilization Plan, Part III). In the event that the City determines that the bidder has submitted a Schedule B: Subcontractor Utilization Plan where the required affirmations are completed but other aspects of the Plan are not complete, or contain a copy or computation error that is at odds with the affirmation, the bidder will be notified by the Agency and will be given four (4) calendar days from receipt of notification to cure the specified deficiencies and return a completed plan to the Agency. Failure to do so will result in a determination that the Bid is non-responsive.

Receipt of notification is defined as the date notice is emailed or faxed (if the bidder has provided an email address or fax number), or no later than five (5) days from the date of mailing or upon delivery, if delivered.

Impact on LBE Requirements: If goals have been established for the participation of M/WBE's, the contractor is not required to comply with the Locally Based Enterprise Program ("LBE"). The LBE Program is set forth in Article 67 of the Contract.

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Tax ID #: _____

PIN#: 8502013FI0003C

Contract # 1 - General Construction Work

The City of New York

SCHEDULE B - Subcontractor Utilization Plan -Part I: Agency's Target

This page to be completed by contracting agency

Contract Overview

Pin # 8502013FI0003C FMS Project ID#: F175QUEEN

Project Title NEW EMS STATION 50

Contracting Agency Department of Design and Construction

Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101

Contact Person James A. Cerasoli Title Deputy Director

Telephone # (718) 391-1549 Email cerasoli@ddc.nyc.gov

Project Description (attach additional pages if necessary)

This Project consists of the construction of a new EMS Station at the Queens Hospital Campus for the FDNY. The building is a two story steel frame with concrete foundations on piles

(1) ✓ Target Subcontracting Percentage

Percentage of total contract dollar value that agency estimates will be awarded to subcontractors in amounts under \$1 million for construction and professional services.

30 %**Subcontractor Participation Goals**

Complete and enter total for each Construction or Professional Services, or both (if applicable)

Group	Construction	Professional Services
Black American	Unspecified %	%
Hispanic American	Unspecified %	%
Asian American	Unspecified %	No Goal
Caucasian Female	No Goal	%
Total Participation Goals	(2) 60 %	(3) %

* Note: For this procurement, individual ethnicity and gender goals are not specified. The Total Participation Goals for construction subcontracts may be met by using Black American, Hispanic American or Asian American firms or any combination of such firms.

Tax ID #: _____

PIN#: _____

SCHEDULE B - Subcontractor Utilization Plan – Part II: Bidder/Proposer Subcontracting Plan

This page and the next (Part II herein) are to be completed by the bidder/proposer. **AFFIRMATIONS; Bidder/proposer must check the applicable boxes below, affirming compliance with M/WBE requirements.**

Bidder/proposer ☐ AFFIRMS or ☐ DOES NOT AFFIRM [statement below]

It is a material term of the contract to be awarded that, with respect to the total amount of the contract to be awarded, bidder/proposer will award one or more subcontracts for amounts under one million dollars, sufficient to meet or exceed the Target Subcontracting Percentage (as set forth in Part I) unless it obtains a full or partial waiver thereof, and it will award subcontracts sufficient to meet or exceed the Total Participation Goals (as set forth in Part I) unless such goals are modified by the Agency.

Bidder/proposer ☐ AFFIRMS that it intends to meet or exceed the Target Subcontracting Percentage (as set forth in Part 1); or
☐ AFFIRMS that it has obtained a full/partial pre-award waiver of the Target Subcontracting Percentage (as set forth in Part I) and intends to award the modified Target Subcontracting Percentage, if any; or
☐ DOES NOT AFFIRM

Section I: Prime Contractor Contact Information

Tax ID # _____ FMS Vendor ID # _____
 Business Name _____ Contact Person _____
 Address _____
 Telephone # _____ Email _____

Section II: General Contract Information**1. Define the industry in which work is to be performed.**

- **Construction** includes all contracts for the construction, rehabilitation, and/or renovation of physical structures. This category does include CM Build as well as other construction related services such as: demolition, asbestos and lead abatement, and painting services, carpentry services, carpet installation and removal, where related to new construction and not maintenance.
- **Professional Services** are a class of services that typically require the provider to have some specialized field or advanced degree. Services of this type include: legal, management consulting, information technology, accounting, auditing, actuarial, advertising, health services, pure construction management, environmental analysis, scientific testing, architecture and engineering, and traffic studies, and similar services.

a. Type of work on Prime Contract (Check one):**b. Type of work on Subcontract (Check all that apply):**

☐ Construction ☐ Professional Services ☐ Construction ☐ Professional Services ☐ Other

2. What is the expected percentage of the total contract dollar value that you expect to award to all subcontracts?

%

3. Will you award subcontract(s) in amounts below \$ 1 million for construction and/or professional services contracts within the first 12 months of the notice to proceed on the contract?

☐ Yes ☐ No

Section III: Subcontractor Utilization Summary

IMPORTANT: If you do not anticipate that you will subcontract at the target level the agency has specified, because you will perform more of the work yourself, you must seek a waiver of the Target Subcontracting Percentage by completing p. 9).

Step 1:	Subcontracts under \$1M (4) (construction/professional services)	Total Bid/Proposal Value	Calculated Target Subcontracting Percentage
Calculate the percentage (of your total bid) that will go towards subcontracts under \$1M for construction and/or professional services	\$ _____	÷ \$ _____	x 100 = _____ %

- **Subcontracts under \$1M (construction/professional services):** Enter the value you expect to award to subcontractors in dollars for amounts under \$1 million for construction and/or professional services. This value defines the amount that participation goals apply to, and will be entered into the first line of Step 2.
- **Total Bid/Proposal Value:** Provide the dollar amount of the bid/proposal.
- **Calculated Target Subcontracting Percentage:** The percentage of the total contract dollar value that will be awarded to one or more subcontractors for amounts under \$1 million for construction and/or professional services. **This percentage must equal or exceed the percentage listed by the agency on page 1, at line (1).**

NOTE: The "Calculated Target Subcontracting Percentage" MUST equal or exceed the Target Subcontracting Percentage listed by the agency on Page 6, Line (1).

Tax ID #: _____

PIN#: _____

SCHEDULE B - cont.**Step 2:**

Calculate value of subcontractor participation goals

Subcontracts under \$1M

(construction/professional services)

- a. Copy value from Step 1, line (4) – the total value of all expected subcontracts under \$1M for construction and/or professional services

\$ _____

↓ ↓

- b. * From line a. above, allocate the dollar value of "Subcontracts under \$1M" by Construction and Professional Services,

Construction**Professional Services**

* If all subcontracts under \$1M are in one industry, enter '0' for the industry with no subcontracts.

* Amounts listed on these lines should add up to the value from line a.

Subcontracts under \$1M by Industry \$ _____ \$ _____

* For Construction enter percentage from line (2) from Page 6.

* For Professional Services enter percentage from line (3) from Page 6.

- c. * **Total Participation Goals Percentages must be copied from Part I, lines (2) and (3).**

Total Participation Goals x _____ %

x _____ %

- d. **Value of Total Participation Goals** \$ _____ \$ _____

Step 3:

Enter brief description of type(s) of subcontracts in amounts under \$1M anticipated, by type of work, not by name of subcontractor

- ☒ **Subcontracts in Amounts Under \$1 M Scope of Work – Construction**

Enter brief description of type(s) of subcontracts in amounts under \$1M anticipated, by type of work, not by name of subcontractor

- ☒ **Subcontracts in Amounts Under \$1 M Scope of Work – Professional Services**

Section IV: Vendor Certification and Required Affirmations

I hereby 1) acknowledge my understanding of the M/WBE requirements as set forth herein and the pertinent provisions of Local Law 129 of 2005, and the rules promulgated thereunder; 2) affirm that the information supplied in support of this subcontractor utilization plan is true and correct; 3) agree, if awarded this Contract, to comply with the M/WBE requirements of this Contract and the pertinent provisions of Local Law 129 of 2005, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this contract; 4) agree and affirm that it is a material term of this contract that the Vendor will award subcontract(s) sufficient to meet the Target Subcontracting Percentage, unless a waiver is obtained, and the Vendor will award subcontract(s) sufficient to meet the Total Participation Goals unless such goals are modified by the Agency; and 5) agree and affirm, if awarded this contract the Vendor intends to make all reasonable, good faith efforts to meet the Target Subcontracting Percentage, or If the Vendor has obtained a waiver, the Vendor intends to meet the modified Target Subcontracting Percentage, if any, and the Vendor intends to solicit and obtain the participation of M/WBEs so as to meet the Total Participation Goals unless modified by the Agency.

Signature _____

Date _____

Print Name _____

Title _____

Tax ID #: _____

PIN#: _____

SCHEDULE B**PART III – REQUEST FOR WAIVER OF TARGET SUBCONTRACTING PERCENTAGE****Contract Overview**

Tax ID # _____ FMS Vendor ID # _____

Business Name _____

Contact Name _____ Telephone # _____ Email _____

Type of Procurement ☐ Competitive Sealed Bids ☐ Other Bid/Response Due Date _____

PIN # (for this procurement) _____ Type of work on Prime Contract (Check one):

☐ Construction
☐ Professional Services☐ Construction ☐ Other
☐ Professional Services**SUBCONTRACTING as described in bid/solicitation documents (Copy this % figure from Subcontractor Utilization Plan, Part I, line**

_____% of the total contract value anticipated by the agency to be subcontracted for construction/professional services subcontracts valued below \$1 million (each)

ACTUAL SUBCONTRACTING as anticipated by vendor seeking waiver

_____% of the total contract value anticipated in good faith by the bidder/proposer to be subcontracted for construction/ professional services subcontracts valued below \$1 million (each)

Basis for Waiver Request: Check appropriate box & explain in detail below (attach additional pages if needed)☐ Vendor does not subcontract construction/professional services, and has the capacity and good faith intention to perform all such work itself.☐ Vendor subcontracts some of this type of work but at lower % than bid/solicitation describes, and has the capacity and good faith intention to do so on this contract.☐ Other _____**References****List 3 most recent contracts/subcontracts performed for NYC agencies (if any)**

CONTRACT NO. _____ AGENCY _____ DATE COMPLETED _____

CONTRACT NO. _____ AGENCY _____ DATE COMPLETED _____

CONTRACT NO. _____ AGENCY _____ DATE COMPLETED _____

List 3 most recent contracts/subcontracts performed for other agencies/entities

(complete ONLY if vendor has performed fewer than 3 NYC contracts)

TYPE OF WORK _____ AGENCY/ENTITY _____ DATE COMPLETED _____

Manager at agency/entity that hired vendor (Name/Phone No.) _____

TYPE OF WORK _____ AGENCY/ENTITY _____ DATE COMPLETED _____

Manager at agency/entity that hired vendor (Name/Phone No.) _____

TYPE OF WORK _____ AGENCY/ENTITY _____ DATE COMPLETED _____

Manager at agency/entity that hired vendor (Name/Phone No.) _____

VENDOR CERTIFICATION: I hereby affirm that the information supplied in support of this waiver request is true and correct, and that this request is made in good faith.

Signature: _____ Date: _____

Print Name: _____ Title: _____

Shaded area below is for agency completion only**AGENCY CHIEF CONTACTING OFFICER APPROVAL**

Signature: _____ Date: _____

CITY CHIEF PROCUREMENT OFFICER APPROVAL

Signature: _____ Date: _____

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**BID FORM
THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES**

**BID FOR FURNISHING ALL LABOR AND
MATERIAL NECESSARY AND REQUIRED FOR:**

PROJECT ID: F175QUEEN

**NEW EMS STATION 50
159-10 Goethals Avenue
Queens 11432**

Name of Bidder: _____

Date of Bid Opening: _____

Bidder is: (Check one, whichever applies) Individual () Partnership () Corporation ()

Place of Business of Bidder: _____

Bidder's Telephone Number: _____ Bidder's Fax Number: _____

Bidder's Email Address: _____

Residence of Bidder (If Individual): _____

If Bidder is a Partnership, fill in the following blanks:

Names of Partners

Residence of Partners

If Bidder is a Corporation, fill in the following blanks:

Organized under the laws of the State of _____

Name and Home Address of President: _____

Name and Home Address of Secretary: _____

Name and Home Address of Treasurer: _____

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BID FORM

The above-named Bidder affirms and declares:

1. The said bidder is of lawful age and the only one interested in this bid; and no person, firm or corporation other than hereinbefore named has any interest in this bid, or in the Contract proposed to be taken.
2. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief: (1) the prices in this bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (2) unless otherwise required by law, the prices quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (3) no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
3. No councilman or other officer or employee or person whose salary is payable in whole or in part from the City Treasury is directly or indirectly interested in this bid, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.
4. The bidder is not in arrears to the City of New York upon debt or contract or taxes, and is not a defaulter, as surety or otherwise, upon any obligation of the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York or State of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except as set forth on the Affirmation included as page 17 of this Bid Booklet.

The bidder hereby affirms that it has paid all applicable City income, excise and other taxes for all years it has conducted business activities in New York City.

5. The bidder, as an individual, or as a member, partner, director or officer of the bidder, if the same be a firm, partnership or corporation, executes this document expressly warranting and representing that should this bid be accepted by the City and the Contract awarded to him, he and his subcontractors engaged in the performance:
(1) will comply with the provisions of Section 6-108 of the Administrative Code of the City of New York and the non-discrimination provisions of Section 220a of the New York State Labor Law, as more expressly and in detail set forth in the Agreement; (2) will comply with Section 6-109 of the Administrative Code of the City of New York in relation to minimum wages and other stipulations as more expressly and in detail set forth in the Agreement; (3) have complied with the provisions of the aforesaid laws since their respective effective dates, and (4) will post notices to be furnished by the City, setting forth the requirements of the aforesaid laws in prominent and conspicuous places in each and every plant, factory, building and structure where employees engaged in the performance of the Contract can readily view it, and will continue to keep such notices posted until the supplies, materials and equipment, or work labor and services required to be furnished or rendered by the Contractor have been finally accepted by the City. In the event of any breach or violation of the foregoing, the Contractor may be subject to damages, liquidated or otherwise, cancellation of the Contract and suspension as a bidder for a period of three years. (The words, "the bidder", "he", "his", and "him" where used shall mean the individual bidder, firm, partnership or corporation executing this bid).

6. Compliance Report

The bidder, as an individual, or as a member, partner, director, or officer of the bidder, if the same be a firm, partnership, or corporation, (1) represents that his attention has been specifically drawn to Executive Order No. 50, dated April 25, 1980, on Equal Employment Compliance of the contract, and (2) warrants that he will comply with the provisions of Executive Order No. 50. The Employment Report must be submitted as part of the bid.

The bidder, as an individual, or as a member, partner, director, or officer of the bidder, if the same be a firm, partnership, or corporation, executes this document expressly warranting that he will comply with: (1) the provision of the contract on providing records, Chapter 8.

7. By submission of this bid, the bidder certifies that it now has and will continue to have the financial capability to fully perform the work required for this contract. Any award of this contract will be made in reliance upon such certification. Upon request therefor, the bidder will submit written verification of such financial capability in a form that is acceptable to the department.

8. In accordance with Section 165 of the State Finance Law, the bidder agrees that tropical hardwoods, as defined in Section 165 of the State Finance Law, shall not be utilized in the performance of this Contract, except as the same are permitted by the foregoing provision of law.

9. The bidder has visited and examined the site of the work and has carefully examined the Contract in the form approved by the Corporation Counsel, and will execute the Contract and perform all its items, covenants and conditions, and will provide, furnish and deliver all the work, materials, supplies, tools and appliances for all labor and materials necessary or required for the hereinafter named work, all in strict conformity with the Contract, for the prices set forth in the Bid Schedule:

BID FORM

PROJECT ID: F175QUEEN

TOTAL BID PRICE: In the space provided below, the Bidder shall indicate the total bid price in figures.

- A. **LUMP SUM PRICE** - Total price for all labor and material for all required work, excluding items (B) and (C) set forth below. Total Price shall include all costs and expenses, i.e. labor, material overhead and profit for all the Work, described and shown in the drawings and specifications.

Total Price For
Labor

Total Price for Material
Sold and Delivered

\$ _____ + \$ _____ Total Price for Item A \$ _____

- B. **ALLOWANCE** for Incidental Asbestos Abatement (Section 028013 of the Specifications) **\$15,000.00**

- C. **AMOUNT** for Proprietary Items (page 2a) **\$306,690.00**

TOTAL BID PRICE (Add A + B + C)
(a/k/a BID PROPOSAL) \$ _____

BIDDER'S SIGNATURE AND AFFIDAVIT

WARNING!! Failure to comply with items below will result in the rejection of your bid.

- * **SUBCONTRACTORS:** You **MUST** complete and submit the form entitled "Bidder's Identification of Subcontractors" (See Page 17) at the time you submit your bid. You must submit this form in a separate, sealed envelope (BID ENVELOPE #2). In the event an award of contract is not made to the Bidder, the Bidder hereby authorizes the Agency to shred the form entitled "Bidder's Identification of Subcontractors". _____ Yes
_____ No

- * **MWBE GOALS:** You **MUST** complete and submit the Affirmations contained in the Subcontractor Utilization Plan (See Page 7), or a pre-approved waiver (See Page 9), at the time you submit your bid. You must submit the Affirmations (or a pre-approved waiver) in BID ENVELOPE #1.

Bidder: _____

By: _____
(Signature of Partner or corporate officer)

Attest: _____ Secretary of Corporate Bidder
(Corporate Seal)

Affidavit on the following page should be subscribed
and sworn to before a Notary Public

THIS PAGE INTENTIONALLY LEFT BLANK

BID FORM (TO BE NOTARIZED)

AFFIDAVIT WHERE BIDDERS IS AN INDIVIDUAL

STATE OF NEW YORK, COUNTY OF _____ ss:

being duly sworn says:

I am the person described in and who executed the foregoing bid, and the several matters therein stated are in all respects true.

(Signature of the person who signed the Bid)

Subscribed and sworn to before me this
_____ day of _____,

Notary Public

AFFIDAVIT WHERE BIDDERS IS A PARTNERSHIP

STATE OF NEW YORK, COUNTY OF _____ ss:

being duly sworn says:

I am a member of _____ the firm described in and which executed the foregoing bid.
subscribed the name of the firm thereto on behalf of the firm, and the several matters therein stated are in all respects true.

(Signature of Partner who signed the Bid)

Subscribed and sworn to before me this
_____ day of _____,

Notary Public

AFFIDAVIT WHERE BIDDERS IS A CORPORATION

STATE OF NEW YORK, COUNTY OF _____ ss:

being duly sworn says:

I am the _____ of the above named corporation whose name is subscribed to and which executed
the foregoing bid. I reside at _____
I have knowledge of the several matters therein stated, and they are in all respects true.

(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this
_____ day of _____,

Notary Public

AFFIRMATION

The undersigned bidder affirms and declares that said bidder is not in arrears to the City of New York upon debt, contract or taxes and is not a defaulter, as surety or otherwise, upon obligation to the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except _____

(If none, the bidder shall insert the word "None" in the space provided above.)

Full Name of Bidder: _____

Address: _____

City: _____ State: _____ Zip Code: _____

CHECK ONE BOX AND INCLUDE APPROPRIATE NUMBER:

☐ A - Individual or Sole Proprietorship *
SOCIAL SECURITY NUMBER

☐ B - Partnership, Joint Venture or other unincorporated organization
EMPLOYER IDENTIFICATION NUMBER

☐ C - Corporation
EMPLOYER IDENTIFICATION NUMBER

By: _____
Signature: _____

Title: _____

If a corporation, place seal here

This affirmation must be signed by an officer or duly authorized representative.

* Under the Federal Privacy Act the furnishing of Social Security Numbers by bidders on City contracts is voluntary. Failure to provide a Social Security Number will not result in a bidder's disqualification. Social Security Numbers will be used to identify bidders, proposers or vendors to ensure their compliance with laws, to assist the City in enforcement of laws, as well as to provide the City a means of identifying of businesses which seek City contracts.

BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

NOTICE TO BIDDERS

SUBMISSION: The Bidder must, at the time of the bid, submit the form on the next page ("BIDDER'S IDENTIFICATION OF SUBCONTRACTORS"). This form must be submitted in a separate, sealed envelope (BID ENVELOPE #2). Failure to do so will result in the disqualification of the bid as non-responsive.

Please be advised that pursuant to GML § 101(5) the Bidder is required to submit with its bid the names of subcontractors it intends to use to perform the following work on this contract, as well as the agreed-upon amount to be paid to each:

- plumbing and gas fitting;
- steam heating, hot water heating, ventilating and air conditioning apparatus; and
- electric wiring and standard illuminating fixtures.

NOTE: This project may not involve all of the above listed subcontractors. Please see the form on the next page which indicates the subcontractors required for this Project.

The list of subcontractors is to be submitted in a separate sealed envelope by completing the form on the next page entitled "Bidder's Identification of Subcontractors". This form provides for the identification of any subcontractors intended to be used in any of the three trades listed above. If bidder intends to use its own forces for any of the above listed work, bidder should so indicate on the form.

Failure to submit the completed form on the next page ("Bidder's Identification of Subcontractors") that includes the names of subcontractors and the agreed upon amounts to be paid to such subcontractors will render the bid non-responsive.

PLEASE NOTE: for any contract that is subject to M/WBE participation goals under Local Law 129, if the bidder's intention to use its own forces to do any of the above-referenced work would result in Bidder's failure to attain the Target Subcontracting Percentage identified in the Subcontractor Utilization Plan, the bid will be non-responsive unless the bidder requests and obtains a Waiver of Target Subcontracting Percentage (Subcontractor Utilization Plan, Part III) in advance of bid submission.

After the low bid is announced, the sealed list submitted by the low bidder will be opened and the names of the subcontractors will be announced. The sealed lists of subcontractors submitted by all other bidders shall be maintained by the Agency unopened unless such bidder shall become the low bidder (e.g., the initial low bidder is found non-responsive). All unopened lists of subcontractors shall be returned to the bidders unopened after contract award, unless the bidder has given the agency permission to shred the form.

After bid submission, any change of subcontractor or agreed-upon amount to be paid to each shall require approval of the Agency upon a showing of a legitimate construction need which shall include, but not be limited to, a change in project specifications, a change in project material costs, a change to subcontractor status as determined pursuant to §222 (2)(e) of the Labor Law, or if the subcontractor has become otherwise unwilling, unable or unavailable to perform the subcontract.

BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

Project ID: F175QUEEN

SUBMISSION: In addition to its Bid (Bid Envelope # 1), the Bidder must, at the time of the bid, complete and submit this form in a separate, sealed envelope (Bid Envelope # 2). To complete this form, the Bidder must identify the subcontractors it intends to use for the work listed below, as well as the dollar amount to be paid to each subcontractor. Failure to complete this form and submit it in a separate, sealed envelope will result in the disqualification of the bid as non-responsive.

The Bidder intends to use the following subcontractors. If the Bidder intends to do any of the work referenced below with its own forces, the Bidder should complete this form using its own name. If multiple subcontractors for any trade are proposed, Bidder may submit multiple copies of this form.

1. PLUMBING CONTRACTOR:

(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ _____

2. HVAC CONTRACTOR:

(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ _____

3. ELECTRICAL CONTRACTOR:

(Print Name)

Agreed Amount To Be Paid To Subcontractor: \$ _____

BIDDER'S SIGNATURE: The Bidder must sign this form in the space provided below:

Name of Bidder: _____

By: _____
Signature of Partner or Corporate Officer

Print Name: _____

Title: _____

BID BOND 1
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, _____

hereinafter referred to as the "Principal", and _____

hereinafter referred to as the "Surety" are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "CITY", or to its successors and assigns in the penal sum of _____

(\$ _____), Dollars lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the Principal is about to submit (or has submitted) to the City the accompanying proposal, hereby made a part hereof, to enter into a contract in writing for _____

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall not withdraw said Proposal without the consent of the City for a period of forty-five (45) days after the opening of bids and in the event of acceptance of the Principal's Proposal by the City, if the Principal shall:

(a) Within ten (10) days after notification by the City, execute in quadruplicate and deliver to the City all the executed counterparts of the Contract in the form set forth in the Contract Documents, in accordance with the proposal as accepted, and

(b) Furnish a performance bond and separate payment bond, as may be required by the City, for the faithful performance and proper fulfillment of such Contract, which bonds shall be satisfactory in all respects to the City and shall be executed by good and sufficient sureties, and

(c) In all respects perform the agreement created by the acceptance of said Proposal as provided in the Information for Bidders, bound herewith and made a part hereof, or if the City shall reject the aforesaid Proposal, then this obligation shall be null and void; otherwise to remain in full force and effect.

BID BOND 2

In the event that the Proposal of the Principal shall be accepted and the Contract be awarded to him the Surety hereunder agrees subject only to the payment by the Principal of the premium therefore, if requested by the City, to write the aforementioned performance and payment bonds in the form set forth in the Contract Documents.

It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

There shall be no liability under this bond if, in the event of the acceptance of the Principal's Proposal by the City, either a performance bond or payment bond, or both, shall not be required by the City on or before the 30th day after the date on which the City signs the Contract.

The surety, for the value received, hereby stipulates and agrees that the obligations of the Surety and its bond shall in no way be impaired or affected by any postponements of the date upon which the City will receive or open bids, or by any extensions of time within which the City may accept the Principal's Proposal, or by any waiver by the City of any of the requirements of the Information for Bidders, and the Surety hereby waives notice of any such postponements, extensions, or waivers.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the _____ day of _____, _____.

(Seal)

Principal (L.S.)

By: _____

(Seal)

Surety

By: _____

BID BOND 3

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of _____ County of _____ ss:
On this _____ day of _____, _____, before me personally came
_____ to me known, who, being by me duly sworn, did depose and say that he
resides at _____
that he is the _____ of _____
the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the
directors of said corporation, and that he signed his name thereto by like order.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:
On this _____ day of _____, _____, before me personally appeared
_____ to me known and known to me to be one of the members of the firm of
_____ described in and who executed the foregoing instrument, and he
acknowledged to me that he executed the same as and for the act and deed of said firm.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:
On this _____ day of _____, _____, before me personally appeared
_____ to me known and known to me to be the person described in and who
executed the foregoing instrument and acknowledged that he executed the same.

Notary Public

AFFIX ACKNOWLEDGEMENTS AND JUSTIFICATION OF SURETIES

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BID BREAKDOWN

Submission: Bidders are advised that the requirement to submit a Bid Breakdown applies to each contract for which an "X" is indicated before the word "Yes". If required, the bidder must submit, with its bid, a completed Bid Breakdown. Failure to provide a completed Bid Breakdown may result in rejection of the bid as non-responsive.

 X YES NO

Limitations on Use of Bid Breakdown:

Bidders are advised that the Bid Breakdown shall be used for bid analysis purposes only and shall not be binding for any other purposes under the Contract, including, without limitation, for payment purposes or in connection with a contractor claim for extra work. If the form for the Bid Breakdown does not include an item of work required by the Contract Documents, such omission shall have no effect whatsoever, nor shall it be used by the contractor in connection with a claim for extra work (i.e., work for which the contractor is entitled to a change order).

Instructions for Preparing Bid Breakdown:

- (A) The Bid Breakdown is set forth on the following pages of this Bid Booklet and is in accordance with the Construction Specification Institute (CSI) format. For all items of work listed in the Bid Breakdown, the bidder must indicate the price for labor and the price for material, as well as the estimated quantities required.
- (B) In preparing its Bid Breakdown, the bidder shall submit prices that include all costs for overhead and profit. Overhead shall include, without limitation, all costs in connection with the following: administration, management, superintendence, small tools, insurance, bonds, and provision of services or items required by the General Conditions [except for Security/Fire Guard Services and Temporary Heat]. If the Project requires Security/Fire Guard Services and/or Temporary Heat, such service(s) will be included as separate line items in the Bid Breakdown.
- (C) If an item is set forth in the Bid Breakdown, but is not included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to leave the item blank and exclude the cost of the item from its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items left blank.
- (D) If an item is not set forth in the Bid Breakdown, but is included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to add the item to its Bid Breakdown and include the cost of the item in its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items added.

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
CONTRACT 1 - GENERAL CONSTRUCTION WORK								
01 0000	GENERAL REQUIREMENTS							
	MOBILIZATION		LS					
	SECURITY GUARDS/FIRE GUARDS ON SITE		LS					
	subtotal							
02 0000	EXISTING CONDITIONS							
02 6100	REMOVAL AND DISPOSAL OF CONTAMINATED SOILS		LS					
	subtotal							
02 8213	ASBESTOS ABATEMENT		LS					
	subtotal							
03 0000	CONCRETE							
03 3000	CAST-IN-PLACE CONCRETE							
03 3300	ARCHITECTURAL CAST-IN-PLACE CONCRETE							
03 4113	PRE-CAST CONCRETE HOLLOW CORE PLANKS							
03 5300	CONCRETE TOPPING							
	12" CONCRETE WALL		CY					
	14" CONCRETE WALL		CY					
	FORM LINER		SF					
	16" PRECAST CONC PLANK		SF					
	4" CONCRETE TOPPING		SF					
	3" CONC RAT SLAB		SF					
	5" SOG		SF					
	14" SLAB ON GRADE		CY					
	12" SLAB ON GRADE		CY					
	CONCRETE ON METAL DECK		SF					
	CONCRETE AT STEEL PAN STR		FLT					
	CONCRETE STAIRS		FLT					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
04 0000	MASONRY							
04 2000	UNIT MASONRY							
	CMU PARTITIONS		SF					
	CMU VENEER		SF					
	subtotal							
05 5000	METALS							
05 1223	STRUCTURAL STEEL							
05 1225	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL							
	STRUCT STL TRUSSES/FRM/COL		TON					
	MOMENT CONN		EA					
	subtotal							
05 3100	METAL DECKS							
	2" 18 GA DECKING		SF					
	1 1/2" 18 GA DECKING		SF					
	1 1/2" 16 GA DECKING		SF					
	subtotal							
05 4000	COLD FORMED METAL FRAMING							
05 5000	MISCELLANEOUS METALS							
	LOOSE RAILS		LF					
	MISC. STEEL		LS					
	ORNAMENTAL ALUM EXT PNL		SF					
	ALUM EXTERIOR FASCIA 30"		LF					
	ORNAMENTAL MTL. HANDRAILS		LF					
	ORNAMNT. STL/GLS RAIL @BLCNY		LF					
	subtotal							
05 5100	STEEL PAN STAIRS		FLGT					
	subtotal							
05 6000	STRUCTURAL BEARING ASSEMBLIES (INCLUDED ABOVE)							

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CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
06 0000	<u>WOODS, PLASTICS AND COMPOSITES</u>							
06 2000	CARPENTRY							
06 4023	ARCHITECTURAL WOODWORK WORKSTATION		LF					
	subtotal							
07 0000	<u>THERMAL/MOISTURE PROTECTION</u>							
07 1616	CRYSTALLINE WATERPROOFING FOUNDATION WATERPROOF		SF					
	subtotal							
07 2100	THERMAL INSULATION		(INCLUDED)					
07 2616	BELOW GRADE VAPOR RETARDERS		(INCLUDED)					
07 4243	ALUMINUM COMPOSITE WALL PANELS SOFFIT-ALUMINUM PANEL ALUMINUM PNL. AT END WALL		SF SF					
	subtotal							
07 5419	POLYVINYL-CHLORIDE (PVC) ROOFING SARNAFIL ROOFING		SF					
	subtotal							
07 6200	SHEET METAL WORK		(INCLUDED)					
07 7100	ROOF SPECIALTIES AND ACCESSORIES ROOF HATCH 3-6x3-6		EA					
	subtotal							
07 8413	FIRESTOPS AND SMOKESEALS							
07 9200	JOINT SEALERS CAULKING		SF					
	subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
08 0000	OPENINGS							
08 1113	STEEL DOORS AND FRAMES							
	HM DR/FR		EA					
	EXT HM DR/FR		EA					
	subtotal							
08 3113	ACCESS DOORS		(INCLUDED)					
08 3600	SECTIONAL OVERHEAD DOORS							
	SECTIONAL DOOR ASSEMBLY (see Bid Booklet page 2a)		SF					
	subtotal							
08 4413	GLAZED ALUMINUM CURTAIN WALLS							
	EXT GLASS CURTAIN WALL		SF					
	GLASS PATTERNING		SF					
	PROJECTION WINDOWS		EA					
	FIRE RATED GLAZING		SF					
	GLASS TRANSOM		SF					
	ALUM/GLASS DOORS		PR					
	subtotal							
08 7100	FINISH HARDWARE							
	SETS		EA					
	subtotal							
08 7300	AUTOMATIC DOOR OPERATORS		(INCLUDED)					
08 8000	GLASS AND GLAZING		(INCLUDED)					
08 9000	LOUVERS AND VENTS		(INCLUDED)					
08 9119	EXTRUDED ALUMINUM STATIONARY LOUVERS		(INCLUDED)					
09 0000	FINISHES							
09 2116	GYP SUM BOARD SHAFT WALL ASSEMBLIES							
09 2900	GYP SUM DRYWALL							
	EXTERIOR FRAMING/INSUL		SF					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	CORRIDOR PARTITION		SF					
	STAIR PARTITION		SF					
	SHAFT FURRING		SF					
	CHASE PARTITION		SF					
	INTERIOR PARTITION		SF					
	EXT FURRING		SF					
	BALCONY FASCIA SOFFIT		SF					
	GYP CEILINGS		SF					
	subtotal							
09 3000	CERAMIC TILE							
	CERAMIC FLOOR		SF					
	CERAMIC WALL		SF					
	subtotal							
09 6500	RESILIENT TILE FLOORING AND BASE							
	RUBBER FLOOR TILE/BASE		SF					
	subtotal							
09 6510	RESILIENT SHEET FLOORING							
	subtotal							
09 6813	CARPET TILE		SF					
	subtotal							
09 9000	PAINTING AND FINISHING							
09 9646	INTUMESCENT COATINGS							
	GYP WALLS		SF					
	CMU/CONC WALLS		SF					
	GYP CEILINGS		SF					
	EXPOSED CEILINGS		SF					
	STAIRS		FLGT					
	GARAGE FLOOR		SF					
	subtotal							

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CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
10 0000	SPECIALTIES							
10 2114	TOILET PARTITIONS							
	TOILET PARTITIONS		STALL					
	subtotal							
10 2800	TOILET ACCESSORIES							
	TOILET MIRRORS		EA					
	TOILET ACCESSORIES		FIXT					
	subtotal							
10 4000	SIGNAGE							
	STL STL LASER CUT SIGNAGE		LTR					
	STAR OF LIFE PLAQUE		EA					
	FDNY PLAQUE		EA					
	INTERIOR SIGNAGE		DR					
	subtotal							
10 4416	FIRE EXTINGUISHERS AND CABINETS							
	DWYER UNIT		LS					
	subtotal							
10 5513	LOCKERS							
	LOCKERS AND BENCHES		LS					
	subtotal							
10 7500	FLAGPOLES							
	NYC PARKS STD. FLAG POLE		EA					
	subtotal							
11 0000	EQUIPMENT							
11 2600	UNIT KITCHENS		LS					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
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CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
11 3100	RESIDENTIAL APPLIANCES		LS					
	subtotal							
12 0000	FURNISHINGS							
12 2413	WINDOW SHADES		LS					
	subtotal							
12 4816	FOOT GRILLES		LS					
	subtotal							
14 0000	CONVEYING EQUIPMENT							
14 2400	HYDRAULIC ELEVATORS							
	3 STOP HYDRAULIC ELEV		EA					
	subtotal							
21 0000	FIRE SUPPRESSION							
	SPRINKLER HEADS		EA					
	FIRE PUMP		EA					
	ZONE CONTROL ASSEMBLY		EA					
	SIAMESE CONNECTION		EA					
	PIPE, 1"		LF					
	PIPE, 1.25"		LF					
	PIPE, 1.5"		LF					
	PIPE, 2"		LF					
	PIPE, 2.5"		LF					
	PIPE, 3"		LF					
	PIPE, 4"		LF					
	HANGERS/ SLEEVES/ INSERTS		LF					
	VALVES/ TRAPS/ MISC.		LF					
	SAFETY/SITE LOGISTICS		TD					
	VIBRATION/ SEISMIC BRACING		TD					
	TESTING		TD					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER
CLIENT AGENCY

F175QUEEN
FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
22 0000	PLUMBING							
	FIXTURES/ EQUIPMENT							
	WATER CLOSET		EA					
	WATER CLOSET, H/C		EA					
	URINAL		EA					
	LAVATORY		EA					
	STAINLESS STEEL SINK		EA					
	SOIL SINK		EA					
	DEEP SINK		EA					
	E/M EYEWASH		EA					
	SHOWER		EA					
	ELECTRIC EYE OPERATOR		EA					
	HOT WATER HEATER		EA					
	HOT WATER HEATER, POINT OF USE		EA					
	CIRCULATING PUMP		EA					
	SEWAGE EJECTOR PUMP		EA					
	SUMP PUMP		EA					
	subtotal							
	PIPING							
	DOMESTIC WATER							
	PIPE, .5"		LF					
	PIPE, .75"		LF					
	PIPE, 1"		LF					
	PIPE, 1.25"		LF					
	PIPE, 1.5"		LF					
	PIPE, 2"		LF					
	subtotal							
	SANITARY/ WASTE							
	PIPE, 1.5"		LF					
	PIPE, 2"		LF					
	PIPE, 3"		LF					
	PIPE, 4"		LF					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	STORM							
			LF					
			LF					
	GAS		LF					
		subtotal						
			LF					
			LF					
			LF					
			LF					
	INSULATION		LF					
			LF					
			LF					
			LF					
			LF					
			LF					
		subtotal						
	SITEWORK							
			EA					
			EA					
	RETENTION TANK		EA					
			LF					
			EA					
	TRENCH DRAIN		EA					
			LF					
	CURB BOX/ SHUT-OFF VALVE		LF					
			LF					
	PIPE, 4", DIP		LF					
			LF					
			LF					

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	TRENCH/ FILL/ REPLACE PAVEMENT		LF					
	CONNECT TO EXISTING		EA					
	subtotal							
	MISC. EQUIPMENT & PROCEDURES							
	HANGERS/ SLEEVES/ INSERTS		LF					
	VALVES/ TRAPS/ MISC.		LF					
	GAS VALVE		EA					
	GAS METER RIG/ SHUT OFF		EA					
	WATER METERS, RPZ'S/ BFP'S		EA					
	DEMOLITION		TD					
	SAFETY/SITE LOGISTICS		TD					
	VIBRATION/ SEISMIC BRACING		EA					
	TESTING		TD					
	RELOCATE SEWER LINE		EA					
	FUEL OIL TANK/ PIPING		EA					
	FLOOR DRAINS		EA					
	ROOF DRAINS		EA					
	EQUIPMENT CONNECTIONS		EA					
	CONNECT KITCHEN EQUIPMENT		EA					
	SLEEVE/ FIREPROOF		EA					
	subtotal							
23 0000	HVAC							
	EQUIPMENT							
	RTU 3, 4, 5, 6, -5 TONS		EA					
	RTU 1, 2, -6 TONS		EA					
	A/C 1, 2, 3, 4		EA					
	A/C 2-1, 2-2		EA					
	AIR COOLED CONDENSER		EA					
	MAKE UP AIR UNIT, 2,000 CFM		EA					
	UNIT HEATER		EA					
	TRUCK EXHAUST		EA					
	TOILET EXHAUST FANS		EA					
	GARAGE EXHAUST FAN		EA					

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NEW YORK CITY DEPARTMENT OF
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CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	EXHAUST FAN		EA					
	SMOKE EXHAUST FAN		EA					
	DECON FAN		EA					
	subtotal							
	PIPE							
	PIPE, 1", DRAIN		LF					
	PIPE, 1.25"		LF					
	PIPE, 1.5"		LF					
	subtotal							
	PIPE REFRIDGERANT							
	PIPE, .5"		LF					
	PIPE, 1.25"		LF					
	subtotal							
	SHEETMETAL							
	DUCTWORK		LBS					
	SUPPLY REGISTERS		EA					
	RETURN REGISTERS		EA					
	RETURN REGISTERS, FBR		LF					
	LINEAR DIFFUSERS		LF					
	GARAGE EXHAUST DUCT & CONNECTIONS	see Bid	LBS					
	MAGNARAIL & ASSEMBLY ITEMS	Booklet pg	LF					
	MAGNATRACK & MISC. ASSOCIATED ITEMS	2a	LF					
	LOUVERS		SF					
	MOTORIZED DAMPERS		EA					
	ACCESS DOORS		EA					
	SMOKE/FIRE DAMPERS		EA					
	subtotal							
	INSULATION							
	DUCT INSULATION		SF					
	PIPE, .5"		LF					
	PIPE, 1.25"		LF					
	PIPE, 1.5"		LF					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	MISC. EQUIPMENT & PROCEDURES							
	HANGERS/ SLEEVES/ INSERTS		LF					
	VALVES/ TRAPS/ MISC.		LF					
	SUPERVISION		TD					
	VIBRATION/ SEISMIC BRACING		EA					
	DEMOLITION		TD					
	EQUIPMENT CONNECTIONS		EA					
	MISC. RELOCATIONS		TD					
	CORE/ SLEEVE/ FIREPROOF		TD					
	TEST & BALANCE		TD					
	subtotal							
	CONTROLS		EA					
	subtotal							
	RIGGING & HOISTING		TD					
	subtotal							
26 0000	ELECTRICAL							
27 0000	COMMUNICATIONS							
28 0000	ELECTRONIC SAFETY & SECURITY							
	LIGHTING FIXTURES							
	LIGHT FIXTURE, MATERIAL		EA					
	LIGHT FIXTURE, INSTALL		EA					
	LIGHT FIXTURE, LINEAR		LF					
	EXIT FIXTURE		EA					
	JUNCTION BOX		EA					
	BRANCH CIRCUIT		LF					
	subtotal							
	DEVICES							
	SWITCH		EA					
	SWITCH, 3-WAY		EA					
	OCCUPANCY SENSOR		EA					
	DIMMER		EA					

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	RECEPTACLE, DUPLEX		EA					
	RECEPTACLE, DUPLEX, FLOOR MTD.		EA					
	RECEPTACLE, DOUBLE DUPLEX		EA					
	RECEPTACLE, DUPLEX, 20A		EA					
	RECEPTACLE, GFI		EA					
	RECEPTACLE, GFI, W/P		EA					
	JUNCTION BOX		EA					
	JUNCTION BOX, W/P		EA					
	JUNCTION BOX, FLOOR MTD.		EA					
	BRANCH CIRCUIT		LF					
	subtotal							
	SERVICE & DISTRIBUTION							
	CT CABINET/METER PAN		EA					
	MAIN DISCONNECT SWITCH, 600A		EA					
	MAIN DISTRIBUTION BOARD, 600A		EA					
	EM GENERATOR		EA					
	POWER TO GARAGE DOORS		LS					
	AUTO TRANSFER SWITCH, 600A		EA					
	POWER PANEL		EA					
	DISCONNECT SWITCHES		EA					
	CONDUIT, 1"		LF					
	CONDUIT, 1.25"		LF					
	CONDUIT, 1.5"		LF					
	CONDUIT, 4"		LF					
	WIRE, #18		LF					
	WIRE, #8		LF					
	WIRE, #4		LF					
	WIRE, #3		LF					
	WIRE, #2		LF					
	WIRE, #350		LF					
	FEEDERS, UNSIZED		LF					
	CONNECT EQUIPMENT		EA					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
	SPECIAL SYSTEMS							
	SECURITY SYSTEM		EA					
	LIGHTNING PROTECTION SYSTEM		EA					
	DECONTAMINATION SYSTEM		EA					
	subtotal							
	MISC. EQUIPMENT & PROCEDURES							
	SAFETY/SITE LOGISTICS		MH					
	VIBRATION/ SEISMIC BRACING		EA					
	DEMOLITION		MH					
	TV/ OUTLET		EA					
	PHONE/ DATA OUTLET		EA					
	UPS SYSTEM, IF REQUIRED		EA					
	TEMP. LIGHT & POWER		SF					
	CORE/ SLEEVE/ FIREPROOF		EA					
	GROUNDING		EA					
	subtotal							
31 0000	EARTHWORK							
	REMOVALS/EXCAVATION							
	CLEARING AND GRUBBING		SF					
	REMOVE TREES		EA					
	TREE RESTITUTION		LOT					
	REMOVE CONCRETE RW/FTG		LF					
	REMOVE CONCRETE PAVING		SF					
	REMOVE ASPHALT PAVING		SF					
	EXCAVATION REMOVALS		TONS					
	EXCAVATION-CLEAN BACKFILL		TONS					
	subtotal							
	FOUNDATIONS							
	PILES		EA					
	GRADE BEAM 1		CY					
	GRADE BEAM 2		CY					
	GRADE BEAM 3		CY					

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
32 0000	GRADE BEAM 4		CY					
	PILE CAP		CY					
	subtotal							
	<u>EXTERIOR IMPROVEMENTS</u>							
	<u>SITE IMPROVEMENTS</u>							
	ASPHALT PAVING		SF					
	12" CONC RETAINING WALL		CY					
	RW FOOTING/GIR BEAM		CY					
	SOIL PREP & CONC FOR RW							
	STREET CURBS		LF					
	4" SIDEWALK		SF					
	6" CONCRETE APRON		SF					
	CONCRETE STAIR		EA					
	GENERATOR PAD		CY					
	STRIPING		SPA					
	PAVING AT NORTH ENTRY		SF					
	LANDSCAPE BRUSH		SF					
	GRANITE BLOCK AT TREE PITS		SF					
	subtotal							
	<u>MISC SITEWORK</u>							
	5' STEEL FENCING		SF					
	STEEL DRIVE GATE		SF					
	subtotal							
	<u>PLANTING</u>							
	TOPSOIL FOR TREES		CY					
	LAWN COVER		SF					
	PLANTING AT PARKING		SF					
	NEW TREES		EA					
	subtotal							
33 0000	<u>UTILITIES</u>							
	SITE DRAINAGE PIPING SYSTEMS		LS					
	PRECAST CONCRETE DRAINAGE STRUCTURES		LS					
	subtotal							

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONTRACTOR BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION WORK

PROJECT: NEW EMS STATION 50
LOCATION 159-10 Goethals Avenue, Queens, NY 11432
BIDDER:

FMS ID NUMBER F175QUEEN
CLIENT AGENCY FDNY

CSI	ITEM	QUANTITY	UNIT	Unit Cost Material	Total Cost Material	Unit Cost Labor	Total Cost Labor	Total Material + Labor
43 0000	<u>PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE EQUIPMENT</u>							
	FUEL SYSTEM							
	EXCAVATION		CY					
	PEA GRAVEL FILL		CY					
	SHEETING		SF					
	CONCRETE SLAB 12"		SF					
	CONCRETE PUMP ISLAND w/STL. CURB		SF					
	CONCRETE BLOCK (12") PIER 10HT.		EA					
	STEEL BOLLARDS 6"		EA					
	MANHOLE		EA					
	FUEL STORAGE TANK, PIPE, EQUIPMENT		LS					
	ELECTRIC		LS					
	subtotal							
44 0000	<u>POLLUTION AND WASTE CONTROL EQUIPMENT</u>							
	VACUUM EXTRACTION SYSTEM		LS					
	subtotal							
	CONTRACT 1 - GENERAL CONSTRUCTION WORK							

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PLA PROJECT**ATTACHMENT 1 - BID INFORMATION
PROJECT ID: F175QUEEN****DESCRIPTION AND LOCATION OF WORK:**

New EMS Station 50
159-10 Goethals Avenue
Queens, NY 11432
E-PIN: 85013B0106 / DDC PIN: 8502013FL0003C

DOCUMENTS AVAILABLE AT:

Department of Design and Construction, Contract Section
30-30 Thomson Avenue - First Floor, Long Island City, NY 11101

SUBMISSION OF BIDS BEFORE BID OPENING:**TIME TO SUBMIT:**

On or Before: **THURSDAY, JUNE 27, 2013**

BIDS MUST BE CLOCKED IN PRIOR TO BID OPENING

PLACE TO SUBMIT:

Department of Design and Construction, Contract Section (located behind Security Desk)
30-30 Thomson Avenue - First Floor, Long Island City, NY 11101

BID OPENING:

PLACE OF BID OPENING:	Department of Design and Construction Contract Section 30-30 Thomson Avenue – First Floor Long Island City, NY 11101
DATE AND HOUR:	THURSDAY, June 27, 2013 @ 2:00 PM
	LATE BIDS WILL NOT BE ACCEPTED

PRE-BID CONFERENCE:

PLACE	New EMS Station 50 159-10 Goethals Avenue Queens, NY 11432
DATE AND HOUR	WEDNESDAY, JUNE 5 TH , 2013 AT 10:00AM
MANDATORY OR OPTIONAL	OPTIONAL

BID SECURITY:

Bid Security is required in the amount set forth below; provided, however, bid security is not required if the TOTAL BID PRICE set forth on the Bid Form is less than \$1,000,000.

- (1) Bond in an amount not less than 10% of the TOTAL BID PRICE set forth on the Bid Form, OR
- (2) Certified Check in an amount not less than 2% of the TOTAL BID PRICE set forth on the Bid Form

PERFORMANCE AND PAYMENT SECURITY:

Required for Contracts in excess of \$1,000,000.00. Performance and Payment Security shall each be in an amount equal to 100% of the Contract Price

AGENCY CONTACT PERSON:

Lorraine Holley, 30-30 Thomson Avenue - First Floor, Long Island City, Queens, NY 11101
Telephone (718) 391-2200 or (718) 391-2601 Fax: (718) 391-2615

**BID BOOKLET
PART B**

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SAFETY QUESTIONNAIRE

The bidder must include, with its bid, all information requested on this Safety Questionnaire. Failure to provide a completed and signed Safety Questionnaire at the time of bid opening may result in disqualification of the bid as non-responsive.

1. Bidder Information:

Company Name: _____

DDC Project Number: _____

Company Size: _____ Ten (10) employees or less
 _____ Greater than ten (10) employees

_____ Company has previously worked for DDC

2. Type(s) of Construction Work

TYPE OF WORK	LAST 3 YEARS	THIS PROJECT
General Building Construction	_____	_____
Residential Building Construction	_____	_____
Nonresidential Building Construction	_____	_____
Heavy Construction, except building	_____	_____
Highway and Street Construction	_____	_____
Heavy Construction, except highways	_____	_____
Plumbing, Heating, HVAC	_____	_____
Painting and Paper Hanging	_____	_____
Electrical Work	_____	_____
Masonry, Stonework and Plastering	_____	_____
Carpentry and Floor Work	_____	_____
Roofing, Siding, and Sheet Metal	_____	_____
Concrete Work	_____	_____
Specialty Trade Contracting	_____	_____
Asbestos Abatement	_____	_____
Other (specify)	_____	_____

3. Experience Modification Rate:

The Experience Modification Rate (EMR) is a rating generated by the National Council of Compensation Insurance (NCCI). This rating is used to determine the contractor's premium for worker's compensation insurance. The contractor may obtain its EMR by contacting its insurance broker or the NCCI. If the contractor cannot obtain its EMR, it must submit a written explanation as to why.

The Contractor must indicate its Intrastate and Interstate EMR for the past three years. [Note: For contractors with less than three years of experience, the EMR will be considered to be 1.00].

YEAR	<u>INTRASTATE RATE</u>	<u>INTERSTATE RATE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

If the Intrastate and/or Interstate EMR for any of the past three years is greater than 1.00, the contractor must attach, to this questionnaire, a written explanation for the rating and identify what corrective action was taken to correct the situation resulting in that rating.

4. OSHA Information:

_____ Contractor has received a willful violation issued by OSHA or New York City Department of Buildings (NYCDOB) within the last three years.

_____ Contractor has had an incident requiring OSHA notification within 8 hours (i.e., fatality, or hospitalization of three or more employees).

The Occupational Safety and Health Act (OSHA) of 1970 requires employers with ten or more employees, on a yearly basis to complete and maintain on file the form entitled "Log of Work-related Injuries and Illnesses". This form is commonly referred to as the OSHA 300 Log (OSHA 200 Log for 2001 and earlier).

The OSHA 300 Log must be submitted for the last three years for contractors with more than ten employees.

The Contractor must indicate the total number of hours worked by its employees, as reflected in payroll records for the past three years.

The contractor must submit the Incident Rate for Lost Time Injuries (the Incident Rate) for the past three years. The Incident Rate is calculated in accordance with the formula set forth below. For each given year, the total number of incidents is the total number of non-fatal injuries and illnesses reported on the OSHA 300 Log. The 200,000 hours represents the equivalent of 100 employees working forty hours a week, fifty weeks per year.

$$\text{Incident Rate} = \frac{\text{Total Number of Incidents} \times 200,000}{\text{Total Number of Hours Worked by Employees}}$$

YEAR	TOTAL NUMBERS OF HOURS WORKED BY EMPLOYEES	INCIDENT RATE
_____	_____	_____
_____	_____	_____
_____	_____	_____

If the contractor's Incident Rate for any of the past three years is one point higher than the Incident Rate for the type of construction it performs (listed below), the contractor must attach, to this questionnaire, a written explanation for the relatively high rate.

General Building Construction	8.5
Residential Building Construction	7.0
Nonresidential Building Construction	10.2
Heavy Construction, except building	8.7
Highway and Street Construction	9.7
Heavy Construction, except highways	8.3
Plumbing, Heating, HVAC	11.3
Painting and Paper Hanging	6.9
Electrical Work	9.5
Masonry, Stonework and Plastering	10.5
Carpentry and Floor Work	12.2
Roofing, Siding, and Sheet Metal	10.3
Concrete Work	8.6
Specialty Trade Contracting	8.6

5. Safety Performance on Previous DDC Project(s)

_____ Contractor previously audited by the DDC Office of Site Safety.

DDC Project Number(s): _____

_____ Accident on previous DDC Project(s).

_____ Fatality or Life-altering Injury on DDC Project(s) within the last three years.
[Examples of a life-altering injury include loss of limb, loss of a sense (e.g., sight, hearing), or loss of neurological function].

Date: _____

By: _____
(Signature of Owner, Partner, Corporate Officer)

Title: _____

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Pre-Award Process

The bidder is advised that as part of the pre-award review of its bid, it may be required to submit the information described in Sections (A) through (D) below. If required, the bidder must submit such information within five (5) business days following receipt of notification from DDC that it is among the low bidders. Such notification from DDC will be by facsimile or in writing and will specify the types of information which must be submitted.

In the event the bidder fails to submit the required information within the specified time frame, its bid may be rejected as nonresponsive.

- (A) **Project Reference Form:** If required, the bidder must complete and submit the Project Reference Form set forth on pages 28 through 30 of this Bid Booklet. The Project Reference Form consists of 3 parts: (1) Similar Contracts Completed by the Bidder, (2) Contracts Currently Under Construction by the Bidder, and (3) Pending Contracts Not Yet Started by the Bidder.
- (B) **Copy of License:** If required, the bidder must submit a copy of the license under which the bidder will be performing the work. Such license must clearly show the following: (1) Name of the Licensee, (2) License Number, and (3) Expiration date of the License. A copy of the license will be required from bidders for the following contracts: Plumbing Work, Electrical Work and Asbestos Abatement.
- (C) **Financial Information:** If required, the bidder must submit the financial information described below:
- (1) **Audited Financial Statements:** Financial statements (Balance Sheet and Income Statement) of the entity submitting the bid, as audited by an independent auditor licensed to practice as a certified public accountant (CPA). Audited financial statements for the three most recent fiscal years must be submitted. Each such financial statement must include the auditor's standard report.
- If the bidder does not have audited financial statements, it must submit an affidavit attesting to the fact that the bidder does not have such statements. In addition, the bidder must submit the following documentation covering the three most recent fiscal years: signed federal tax returns, unaudited financial statements, and a "certified review letter" from a certified public accountant (CPA) verifying the unaudited financial statements.
- Unless the most recent audited or unaudited financial statement was issued within ninety (90) days, the bidder must submit interim financial information that includes data on financial position and results of operation (income data) for the current fiscal year. Such information may be summarized on a monthly or quarterly basis or at other intervals.
- (2) **Schedule of Aged Accounts Receivable,** including portion due within ninety (90) days.
- (D) **Project Specific Information:** If required, the bidder must submit the project specific information described below:
- (1) **Statement indicating the number of years of experience the bidder has had and in what type of construction.**
- (2) **Resumes of all key personnel to be involved in the project, including the proposed project superintendent.**
- (3) **List of significant pieces of equipment expected to be used for the contract, and whether such equipment is owned or leased.**

- (4) Description of work expected to be subcontracted, and to what firms, if known.
- (5) List of key material suppliers.
- (6) Preliminary bar chart time schedule
- (7) Contractor's expected means of financing the project. This should be based on the assumption that the contractor is required to finance 2X average monthly billings throughout the contract period.
- (8) Any other issues the contractor sees as impacting his ability to complete the project according to the contract.

In addition to the information described in Sections (A) through (D) above, the bidder shall submit such additional information as the Commissioner may require, including without limitation, an explanation or justification for specific unit price items.

The bidder is further advised that it may be required to attend a pre-award meeting with DDC representatives. If such a meeting is convened, the bidder will be advised as to any additional material to be provided.

A. PROJECT REFERENCES – SIMILAR CONTRACTS COMPLETED BY THE BIDDER

List all contracts substantially completed within the last 4 years similar to the contract being awarded, up to a maximum of 10, in descending order of date of substantial completion.

Project & Location	Contract Type	Contract Amount (\$000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner

B. PROJECT REFERENCES – CONTRACTS CURRENTLY UNDER CONSTRUCTION BY THE BIDDER

List all contracts currently under construction even if they are not similar to the contract being awarded.

Project & Location	Contract Type	Contract Amount (\$000)	Subcontracted to Others (\$000)	Uncompleted Portion (\$000)	Date Scheduled to Complete	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner

C. PROJECT REFERENCES - PENDING CONTRACTS NOT YET STARTED BY THE BIDDER

List all contracts awarded to or won by the bidder but not yet started.

Project & Location	Contract Type	Contract Amount (\$000)	Date Scheduled to Start	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner

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**OFFICE OF THE MAYOR
BUREAU OF LABOR SERVICES
CONTRACT CERTIFICATE**

To be completed if the contract is less than \$1,000,000

Contractor: _____

Address: _____

Telephone Number: _____

Name and Title of Signatory: _____

Contracting Agency or Owner: _____

Project Number: _____

Proposed Contract Amount: _____

Description and Address of Proposed Contract: _____

Names of Subcontractors in the amount of 750,000 or more on this contract (if not known at this time, so state indicating that trades will be subcontracted):

I, (fill in name of person signing) _____ ,
hereby affirm that I am authorized by the above-named contractor to certify that said contractor's
proposed contract with the above-named owner or city agency is less than \$1,000,000. This affirmation
is made in accordance with Executive Order No. 50 (1980) as amended and its implementing regulations.

Date

Signature

**WILLFUL OR FRAUDULENT FALSIFICATION OF ANY DATA OR INFORMATION
SUBMITTED HEREWITH MAY RESULT IN THE TERMINATION OF ANY CONTRACT BETWEEN
THE CITY AND THE BIDDER OR CONTRACTOR AND BAR THE BIDDER OR CONTRACTOR FROM
PARTICIPATION IN ANY CITY CONTRACT FOR A PERIOD OF UP TO THREE YEARS. FURTHER,
SUCH FALSIFICATION MAY RESULT IN CRIMINAL PROSECUTION.**

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VENDEX COMPLIANCE

(A) **Vendex Fees:** Pursuant to Procurement Policy Board Rule 2-08(f)(2), the contractor will be charged a fee for the administration of the VENDEX system, including the Vendor Name Check process, if a Vendor Name Check review is required to be conducted by the Department of Investigation. The contractor shall also be required to pay the applicable required fees for any of its subcontractors for which Vendor Name Check reviews are required. The fee(s) will be deducted from payments made to the contractor under the contract. For contracts with an estimated value of less than or equal to \$1,000,000, the fee will be \$175 per Vendor Name Check review. For contracts with an estimated value of greater than \$1,000,000, the fee will be \$350 per Vendor Name Check review.

(B) **Confirmation of Vendex Compliance:** The Bidder shall submit this Confirmation of Vendex Compliance to the Department of Design and Construction, Contracts Section, 30-30 Thomson Avenue – First Floor, Long Island City, NY 11101.

Bid Information: The Bidder shall complete the bid information set forth below.

Name of Bidder: _____
Bidder's Address: _____
Bidder's Telephone Number: _____
Bidder's Fax Number: _____
Date of Bid Opening: _____
Project ID: _____

Vendex Compliance: To demonstrate compliance with Vendex requirements, the Bidder shall complete either Section (1) or Section (2) below, whichever applies.

- (1) **Submission of Vendex Questionnaires to MOCS:** By signing in the space provided below, the Bidder certifies that as of the date specified below, the Bidder has submitted Vendex Questionnaires to the Mayor's Office of Contract Services, Attn: VENDEX, 253 Broadway, 9th Floor, New York, New York 10007.

Date of Submission: _____

By: _____
(Signature of Partner or corporate officer)

Print Name: _____

- (2) **Submission of Certification of No Change to DDC:** By signing in the space provided below, the Bidder certifies that it has read the instructions in a "Vendor's Guide to Vendex" and that such instructions do not require the Bidder to submit Vendex Questionnaires. The Bidder has completed **TWO ORIGINALS** of the Certification of No Change set forth on the next page of this Bid Booklet.

By: _____
(Signature of Partner or corporate officer)

Print Name: _____

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Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.



Principal Name

Date of signature
on last full Principal
Questionnaire

Date(s) of signature on
submission of change

1

2

3

4

5

6

☐ Check if additional changes were submitted and attach a document with the date of additional submissions.

Certification *This section is required.*

This form must be signed and notarized. Please complete this twice. Copies will not be accepted.

Certified By:

Name (Print)

Title

Name of Submitting Entity

Signature

Date

Notarized By:

Notary Public

County License Issued

License Number

Sworn to before me on: _____
Date

Certificate of No Change Form



Mayor's Office of
Contract Services

- Please submit two completed forms. Copies will not be accepted.
- Please send both copies to the agency that requested it, unless you are advised to send it directly to the Mayor's Office of Contract Services (MOCS).
- A materially false statement willfully or fraudulently made in connection with this certification, and/or the failure to conduct appropriate due diligence in verifying the information that is the subject of this certification, may result in rendering the submitting entity non-responsible for the purpose of contract award.
- A materially false statement willfully or fraudulently made in connection with this certification may subject the person making the false statement to criminal charges

I, _____, being duly sworn, state that I have read
Enter Your Name

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

In addition, I further certify on behalf of the submitting vendor that the information contained in the principal questionnaire(s) and any submission of change identified on page two of this form have not changed and have been verified and continue, to the best of my knowledge, to be full, complete and accurate.

I understand that the City of New York will rely on the information supplied in this certification as additional inducement to enter into a contract with the submitting entity.

Vendor Questionnaire *This section is required.*

This refers to the vendor questionnaire(s) submitted for the vendor doing business with the City.

Name of Submitting Entity: _____

Vendor's Address: _____

Vendor's EIN or TIN: _____ Requesting Agency: _____

Are you submitting this Certification as a parent? (Please circle one) Yes No

Signature date on the last full vendor questionnaire signed for the submitting vendor: _____

Signature date on change submission for the submitting vendor: _____

Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.



Principal Name

Date of signature
on last full Principal
Questionnaire

Date(s) of signature on
submission of change

1

2

3

4

5

6

☐ Check if additional changes were submitted and attach a document with the date of additional submissions.

Certification *This section is required.*

This form must be signed and notarized. Please complete this twice. Copies will not be accepted.

Certified By:

Name (Print)

Title

Name of Submitting Entity

Signature

Date

Notarized By:

Notary Public

County License Issued

License Number

Sworn to before me on: _____
Date

Certificate of No Change Form



- Please submit two completed forms. Copies will not be accepted.
- Please send both copies to the agency that requested it, unless you are advised to send it directly to the Mayor's Office of Contract Services (MOCS).
- A materially false statement willfully or fraudulently made in connection with this certification, and/or the failure to conduct appropriate due diligence in verifying the information that is the subject of this certification, may result in rendering the submitting entity non-responsible for the purpose of contract award.
- A materially false statement willfully or fraudulently made in connection with this certification may subject the person making the false statement to criminal charges

I, _____, being duly sworn, state that I have read
Enter Your Name

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

In addition, I further certify on behalf of the submitting vendor that the information contained in the principal questionnaire(s) and any submission of change identified on page two of this form have not changed and have been verified and continue, to the best of my knowledge, to be full, complete and accurate.

I understand that the City of New York will rely on the information supplied in this certification as additional inducement to enter into a contract with the submitting entity.

Vendor Questionnaire *This section is required.*

This refers to the vendor questionnaire(s) submitted for the vendor doing business with the City.

Name of Submitting Entity: _____

Vendor's Address: _____

Vendor's EIN or TIN: _____ Requesting Agency: _____

Are you submitting this Certification as a parent? (Please circle one) Yes No

Signature date on the last full vendor questionnaire signed for the submitting vendor: _____

Signature date on change submission for the submitting vendor: _____

IRAN DIVESTMENT ACT COMPLIANCE RIDER
FOR NEW YORK CITY CONTRACTORS

The Iran Divestment Act of 2012, effective as of April 12, 2012, is codified at State Finance Law ("SFL") §165-a and General Municipal Law ("GML") §103-g. The Iran Divestment Act, with certain exceptions, prohibits municipalities, including the City, from entering into contracts with persons engaged in investment activities in the energy sector of Iran. Pursuant to the terms set forth in SFL §165-a and GML §103-g, a person engages in investment activities in the energy sector of Iran if:

- (a) The person provides goods or services of twenty million dollars or more in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran; or
- (b) The person is a financial institution that extends twenty million dollars or more in credit to another person, for forty-five days or more, if that person will use the credit to provide goods or services in the energy sector in Iran and is identified on a list created pursuant to paragraph (b) of subdivision three of Section 165-a of the State Finance Law and maintained by the Commissioner of the Office of General Services.

A bid or proposal shall not be considered for award nor shall any award be made where the bidder or proposer fails to submit a signed and verified bidder's certification.

Each bidder or proposer must certify that it is not on the list of entities engaged in investment activities in Iran created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. In any case where the bidder or proposer cannot certify that they are not on such list, the bidder or proposer shall so state and shall furnish with the bid or proposal a signed statement which sets forth in detail the reasons why such statement cannot be made. The City of New York may award a bid to a bidder who cannot make the certification on a case by case basis if:

- (1) The investment activities in Iran were made before the effective date of this section (i.e., April 12, 2012), the investment activities in Iran have not been expanded or renewed after the effective date of this section and the person has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran: or
- (2) The City makes a determination that the goods or services are necessary for the City to perform its functions and that, absent such an exemption, the City would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

**BIDDER'S CERTIFICATION OF COMPLIANCE WITH
IRAN DIVESTMENT ACT**

Pursuant to General Municipal Law §103-g, which generally prohibits the City from entering into contracts with persons engaged in investment activities in the energy sector of Iran, the bidder/proposer submits the following certification:

[Please Check One]

BIDDER'S CERTIFICATION

- ☐ By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief, that each bidder/proposer is not on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law.
- ☐ I am unable to certify that my name and the name of the bidder/proposer does not appear on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. I have attached a signed statement setting forth in detail why I cannot so certify.

Dated: _____, New York
_____, 20__

SIGNATURE

PRINTED NAME

TITLE

Sworn to before me this
____ day of _____, 20__

Notary Public

Dated:

CITY OF NEW YORK

DIVISION OF LABOR SERVICES

CONSTRUCTION EMPLOYMENT REPORT

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The City of New York Department of Small Business Services
Division of Labor Services Contract Compliance Unit
110 William Street, New York, New York 10038
Phone: (212) 513 - 6323
Fax: (212) 618-8879

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

1. Your contractual relationship in this contract is: Prime contractor____ Subcontractor____
- 1a. Are M/WBE goals attached to this project? Yes____ No____
2. Please check one of the following if your firm would like information on how to certify with the City of New York as a:
____ Minority Owned Business Enterprise ____ Locally based Business Enterprise
____ Women Owned Business Enterprise ____ Emerging Business Enterprise
- 2a. If you are certified as an **MBE, WBE, or LBE**, what city/state agency are you certified with?
____ Are you DBE certified? Yes____ No____
3. Please indicate if you would like assistance from SBS in identifying certified M/WBEs for contracting opportunities: Yes____ No____
4. Is this project subject to a project labor agreement? Yes____ No____

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

5. _____
Employer Identification Number or Federal Tax I.D./ _____ Email Address
6. _____
Company Name
7. _____
Company Address and Zip Code
8. _____
Chief Operating Officer Telephone Number
9. _____
Designated Equal Opportunity Compliance Officer Telephone Number
(If same as Item #7, write "same")
10. _____
Name of Prime Contractor and Contact Person
(If same as Item #5, write "same")
11. Number of employees in your company: _____

12. Contract information:

- (a) _____
Contracting Agency (City Agency)
- (b) _____
Contract Amount
- (d) _____
Procurement Identification Number (PIN)
- (e) _____
Contract Registration Number (CT#)
- (f) _____
Projected Commencement Date
- (g) _____
Projected Completion Date

(h) Description and location of proposed contract:

13. Has your firm been reviewed by the Division of Labor Services (DLS) within the past 36 months and issued a Certificate of Approval? Yes___ No___

If yes, attach a copy of certificate.

14. Has DLS within the past month reviewed an Employment Report submission for your company and issued a Conditional Certificate of Approval? Yes___ No___

If yes, attach a copy of certificate.

NOTE: DLS WILL NOT ISSUE A CONTINUED CERTIFICATE OF APPROVAL IN CONNECTION WITH THIS CONTRACT UNLESS THE REQUIRED CORRECTIVE ACTIONS IN PRIOR CONDITIONAL CERTIFICATES OF APPROVAL HAVE BEEN TAKEN.

15. Has an Employment Report already been submitted for a different contract (not covered by this Employment Report) for which you have not yet received compliance certificate?
Yes___ No___ If yes,

Date submitted: _____
Agency to which submitted: _____
Name of Agency Person: _____
Contract No: _____
Telephone: _____

16. Has your company in the past 36 months been audited by the United States Department of Labor, Office of Federal Contract Compliance Programs (OFCCP)? Yes___ No___

If yes,

(a) Name and address of OFCCP office.

- (b) Was a Certificate of Equal Employment Compliance issued within the past 36 months?
Yes___ No___

If yes, attach a copy of such certificate.

- (c) Were any corrective actions required or agreed to? Yes___ No___

If yes, attach a copy of such requirements or agreements.

- (d) Were any deficiencies found? Yes___ No___

If yes, attach a copy of such findings.

17. Is your company or its affiliates a member or members of an employers' trade association which is responsible for negotiating collective bargaining agreements (CBA) which affect construction site hiring? Yes___ No___

If yes, attach a list of such associations and all applicable CBA's.

PART II: DOCUMENTS REQUIRED

18. For the following policies or practices, attach the relevant documents (e.g., printed booklets, brochures, manuals, memoranda, etc.). If the policy(ies) are unwritten, attach a full explanation of the practices. See instructions.

- ___ (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)
- ___ (b) Disability, life, other insurance coverage/description
- ___ (c) Employee Policy/Handbook
- ___ (d) Personnel Policy/Manual
- ___ (e) Supervisor's Policy/Manual
- ___ (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered
- ___ (g) Collective bargaining agreement(s).
- ___ (h) Employment Application(s)
- ___ (i) Employee evaluation policy/form(s).
- ___ (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?

19. To comply with the Immigration Reform and Control Act of 1986 when and of whom does your firm require the completion of an I-9 Form?

- | | |
|--|--------------|
| (a) Prior to job offer | Yes___ No___ |
| (b) After a conditional job offer | Yes___ No___ |
| (c) After a job offer | Yes___ No___ |
| (d) Within the first three days on the job | Yes___ No___ |
| (e) To some applicants | Yes___ No___ |
| (f) To all applicants | Yes___ No___ |
| (g) To some employees | Yes___ No___ |
| (h) To all employees | Yes___ No___ |

20. Explain where and how completed I-9 Forms, with their supportive documentation, are maintained and made accessible.

21. Does your firm or any of its collective bargaining agreements require job applicants to take a medical examination? Yes___ No___

If yes, is the medical examination given:

- | | |
|-----------------------------------|--------------|
| (a) Prior to a job offer | Yes___ No___ |
| (b) After a conditional job offer | Yes___ No___ |
| (c) After a job offer | Yes___ No___ |
| (d) To all applicants | Yes___ No___ |
| (e) Only to some applicants | Yes___ No___ |

If yes, list for which applicants below and attach copies of all medical examination or questionnaire forms and instructions utilized for these examinations.

22. Do you have a written equal employment opportunity (EEO) policy? Yes___ No___

If yes, list the document(s) and page number(s) where these written policies are located.

23. Does the company have a current affirmative action plan(s) (AAP)

___ Minorities and Women

___ Individuals with handicaps

___ Other. Please specify _____

24. Does your firm or collective bargaining agreement(s) have an internal grievance procedure with respect to EEO complaints? Yes___ No___

If yes, please attach a copy of this policy.

If no, attach a report detailing your firm's unwritten procedure for handling EEO complaints.

25. Has any employee, within the past three years, filed a complaint pursuant to an internal grievance procedure or with any official of your firm with respect to equal employment opportunity? Yes___ No___

If yes, attach an internal complaint log. See instructions.

26. Has your firm, within the past three years, been named as a defendant (or respondent) in any administrative or judicial action where the complainant (plaintiff) alleged violation of any anti-discrimination or affirmative action laws? Yes___ No___

If yes, attach a log. See instructions.

27. Are there any jobs for which there are physical qualifications? Yes___ No___

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

28. Are there any jobs for which there are age, race, color, national origin, sex, creed, disability, marital status, sexual orientation, or citizenship qualifications? Yes___ No___

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

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SIGNATURE PAGE

I, (print name of authorized official signing) _____ hereby certify that the information submitted herewith is true and complete to the best of my knowledge and belief and submitted with the understanding that compliance with New York City's equal employment requirements, as contained in Chapter 56 of the City Charter, Executive Order No. 50 (1980), as amended, and the implementing Rules and Regulations, is a contractual obligation.

I also agree on behalf of the company to submit a certified copy of payroll records to the Division of Labor Services on a monthly basis.

Contractor's Name

Name of person who prepared this Employment Report

Title

Name of official authorized to sign on behalf of the contractor

Title

Telephone Number

Signature of authorized official

Date

If contractors are found to be underutilizing minorities and females in any given trade based on Chapter 56 Section 3H, the Division of Labor Services reserves the right to request the contractor's workforce data and to implement an employment program.

Contractors who fail to comply with the above mentioned requirements or are found to be in noncompliance may be subject to the withholding of final payment.

Willful or fraudulent falsifications of any data or information submitted herewith may result in the termination of the contract between the City and the bidder or contractor and in disapproval of future contracts for a period of up to five years. Further, such falsification may result in civil and/or criminal prosecution.

To the extent permitted by law and consistent with the proper discharge of DLS' responsibilities under Charter Chapter 56 of the City Charter and Executive Order No. 50 (1980) and the implementing Rules and Regulations, all information provided by a contractor to DLS shall be confidential.

Only original signatures accepted.

Sworn to before me this _____ day of _____ 20 _____

Notary Public

Authorized Signature

Date

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FMS ID: F175QUEEN



**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

NEW EMS STATION 50

**LOCATION: 159-10 Goethals Avenue
BOROUGH: Queens 11432
CITY OF NEW YORK**

Contractor _____

Dated _____, 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper _____

Dated _____, 20____





PROJECT ID:

F175QUEEN

LAW

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/buildnyc

VOLUME 2 OF 3

**PROJECT LABOR AGREEMENT
INFORMATION FOR BIDDERS
CONTRACT
PERFORMANCE AND PAYMENT BONDS
SCHEDULE OF PREVAILING WAGES
GENERAL CONDITIONS**

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR THE PROJECT

NEW EMS STATION 50

LOCATION:
BOROUGH:
CITY OF NEW YORK

159-10 Goethals Avenue
Queens 11432

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

FDNY

Dean/Wolf Architects

Date:

April 25, 2013



N 3-050

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/buildnyc

VOLUME 2 OF 3

**PROJECT LABOR AGREEMENT
INFORMATION FOR BIDDERS
CONTRACT
PERFORMANCE AND PAYMENT BONDS
SCHEDULE OF PREVAILING WAGES
GENERAL CONDITIONS**

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR THE PROJECT



NOTICE:

THIS CONTRACT IS NOT SUBJECT TO THE REQUIREMENTS OF THE WICKS LAW FOR SEPARATE PRIME CONTRACTORS

This contract is subject to a Project Labor Agreement ("PLA"). In accordance with the Labor Law, the requirements of the Wicks Law for separate prime contractors do not apply to any project that is covered by a PLA. Accordingly, the requirements of the Wicks Law for separate prime contractors do not apply to this Project. However, the Contract Documents for this Project (General Conditions, Drawings and Specifications) were prepared as if the requirements of the Wicks Law for separate prime contractors did apply. To correct this situation, the bidder is advised that the Contract Documents are revised as set forth below.

- (A) Delete any and all references to separate responsibilities, separate specifications, separate drawings and/or separate contracts for the four subdivisions of the work listed below:
- General Construction Work (Contract No. 1)
 - Plumbing Work (Contract No. 2)
 - HVAC & Fire Protection Work (Contract No. 3)
 - Electrical Work (Contract No. 4)
- (B) Revise all such references to indicate that:
- The Project consists of a single contract, the Contract for General Construction Work.
 - All responsibilities and obligations in the Contract Documents assigned to the separate Contractors for the four subdivisions of the work listed above are the responsibility of the Contractor for General Construction Work.
 - The Contractor for General Construction Work is responsible for the performance of all required work for the Project as set forth in the Contract Documents, including all responsibilities and obligations assigned to the separate Contractors for the four subdivisions of the work listed above.
- (C) Revise any and all references to Contracts Nos. 2, 3 and 4 to refer to Contract No. 1.
- (D) Revise the specifications for plumbing work to require Contractor for General Construction Work to engage a Licensed Plumber to perform the required plumbing work.
- (E) Revise the specifications for electrical work to require Contractor for General Construction Work to engage a Licensed Electrician to perform the required electrical work.

NOTICE:

THIS CONTRACT IS SUBJECT TO A PROJECT LABOR AGREEMENT

This contract is subject to the attached Project Labor Agreement ("PLA") entered into between the City and the Building and Construction Trades Council of Greater New York ("BCTC") affiliated Local Unions. By submitting a bid, the Contractor agrees that if awarded the Contract the PLA is binding on the Contractor and all subcontractors of all tiers. The bidder to be awarded the contract will be required to execute the attached Letter of Assent prior to award. Contractor shall include in any subcontract a requirement that the subcontractor, and sub-subcontractors of all tiers, become signatory to and bound to the ~~PLA~~ with respect to the subcontracted work. Contractor will also be required to have all subcontractors of all tiers execute the attached Letter of Assent prior to such subcontractors performing any work on the Project. Bidders are advised that the City of New York and City agencies have entered into multiple PLAs. The terms of each PLA, while similar, are not identical. All bidders should carefully read the entire PLA that governs this Contract.

To the extent that the terms of the PLA conflict with any other terms of the invitation for bids, including the Standard Construction Contract, the terms of the PLA shall govern. For example, the PLA section that authorizes the scheduling of a four-day work, ten hours per day on straight time at the commencement of the job, PLA Article 12, section 1, overrides the Standard Construction Contract's provision concerning a five-day work week with a maximum of eight hours in a day, Standard Construction Contract Article 37.2.1. Where, however, the invitation for bids, including the Standard Construction Contract, requires the approval of the City/Department, the PLA does not supersede or eliminate that requirement.

In addition to the various provisions regarding work rules, Contractors should take special note of the requirement that Contractors and Subcontractors make payments to designated employee benefit funds. See PLA Article 11, Section 2. The PLA also contains provisions for what occurs when a contractor or a subcontractor fails to make required payments into the benefit funds, including potentially the direct payment by the City to the benefit fund of monies owed and corresponding withholding of payments to the Contractor. See PLA Article 11, Section 2. The City strongly advises Contractors to read these provisions carefully and to include appropriate provisions in subcontracts addressing these possibilities.

This Contract is subject to the apprenticeship requirements of Labor Law §222 and to apprenticeship requirements established by the Department pursuant to Labor Law §816-b. Please be advised that the involved trades have apprenticeship programs that meet the statutory requirements of Labor Law 222(e) and the requirements set by the Department pursuant to Labor Law §816-b, contractors and subcontractors who agree to perform the Work pursuant to the PLA are participating in such apprenticeship programs within the meaning of Labor Law §222(e) and the Department's directive.

If this Contract is subject to the Minority-Owned and Women-Owned Business Enterprise ("M/WBE") program created by Local Law 129, the specific requirements of M/WBE participation for this Contract are set forth in Schedule B entitled the "Subcontractor Utilization Plan", and are detailed in a separate Notice to Prospective Contractors included with this bid package. If such requirements are included with this Contract, the City strongly advises Contractors to read those provisions, as well as PLA Article 4, Section 2(C), carefully. A list of M/WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6356, or by visiting or writing DSBS at 110 William St., New York, New York, 10038, 7th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311.

The local collective bargaining agreements (CBAs) that are incorporated into the PLA as PLA Schedule A Agreements are available on computer disk from the Department's Contract Officer upon the request of any prospective bidder. Please note that the "PLA Schedule A" is distinct from the Department's Schedule A that is a part of this invitation for bids.

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Q17. Are there special provisions for Saturday work when a day is 'lost' during the week due to weather, power failure or other emergency?

A. Yes, when this occurs the Contractor may schedule Saturday work at weekday rates. See PLA Article 12, Section 5.

Q18. Does the PLA contain special provisions for the manning of Temporary Services?

A. Yes. Where temporary services are required by specific request of the agency or construction manager, they shall be provided by the contractor's existing employees during working hours in which a shift is scheduled for employees of the contractor. The need for temporary services during non-working hours will be determined by the agency or construction manager. There will be no stacking of trades on temporary services. See PLA Article 15.

Q19. What do the workers get paid when work is terminated early in a day due to inclement weather or otherwise cut short of 8 hours?

A. The PLA provides that employees who report to work pursuant to regular schedule and not given work will be paid two hours of straight time. Work terminated early for severe weather or emergency conditions will be paid only for time actually worked. In other instances where work is terminated early, the worker will be paid for a full day. See PLA Article 12, Sections 6 and 8.

Q20. Should a local collective bargaining agreement [local CBA] expire during the project will a work stoppage occur on a project subject to the PLA?

A. No. All the signatory unions are bound by the 'no strike' agreement as to the PLA work. Work will continue under the PLA and the otherwise expired local CBA(s) until the new local CBA(s) are negotiated and in effect. See PLA Articles 7 and 19.

Q21. May a contractor working under the PLA be subject to a strike or other boycott activity by a signatory union at another site while the contractor is a signatory to the PLA?

A. Yes. The PLA applies ONLY to work under the PLA and does not regulate labor relations at other sites even if those sites are in close proximity to PLA work.

Q22. If a contractor has worked under other PLAs in the New York City area, are the provisions in this PLA generally the same as the others?

A. While Project Labor Agreements often look similar to each other, and particular clauses are often used in multiple agreements, each PLA is a unique document and should be examined accordingly.

Q23. What happens if a dispute occurs between the contractor and an employee during the project?

A. The PLA contains a grievance and arbitration process to resolve disputes between the contractor and the employees. See PLA Article 9.

Q24. What happens if there is a dispute between locals as to which local gets to provide employees for a particular project or a particular aspect of a project?

A. The PLA provides for jurisdictional disputes to be resolved in accordance with the NY Plan. See PLA Article 10. A copy of the NY Plan is available upon request from the Department. The PLA provides that work is not to be disrupted or interrupted pending the resolution of any jurisdictional dispute. The work proceeds as assigned by the contractor until the dispute is resolved. See PLA Article 10, Section 3.

A. No, the non-union employee does not automatically become a union member by working on a project covered by the PLA. Non-union employees working under the PLA are subject to the union security provisions (i.e., union dues/agency shop fees) of the local CBAs while on the project. These employees will be enrolled in the appropriate benefit plans and earn credit toward various union benefit programs. See PLA Article 4, Section 6 and Article 11.

Q9. Are all contractors and subcontractors working under the PLA, including non-union contractors and contractors signatory to collective bargaining agreements with locals other than those that are signatories to the PLA, required to make contributions to designated employee benefit funds?

A. Contractors and subcontractors working under the PLA will be required to contribute on behalf of all employees covered by the PLA to established jointly trustee employee benefit funds designated in the Schedule A CBAs and required to be paid on public works under any applicable prevailing wage law. See PLA Article 11, Section 2. The Agency may withhold from amounts due the contractor any amounts required to be paid, but not actually paid into any such fund by the contractor or a subcontractor. See PLA Article 11, Section 2 C.

Q10. What happens if a contractor or subcontractor fails to make a required payment to a designated employee benefit fund?

A. The PLA sets forth a process for unions to address a contractor or a subcontractor's failure to make required payments. The process includes potentially the direct payment by the City to the benefit fund of monies owed and the corresponding withholding of payments to the Contractor. See PLA Article 11, Section 2. The City strongly advises Contractors to read these provisions carefully and to include appropriate provisions in subcontracts addressing these possibilities.

Q11. Does signing on to the PLA satisfy the Apprenticeship Requirements established for this bid?

A. Yes. By agreeing to perform the Work subject to the PLA, the bidder demonstrates compliance with the apprenticeship requirements imposed by this invitation for Bids.

Q12. Does the PLA provide a standard work day across all the signatory trades?

A. Yes, all signatory trades will work an eight (8) hour day, Monday through Friday with a day shift at straight time as the standard work week. The PLA also permits a contractor to schedule a four day [within Monday through Friday] work week, ten (10) hours per day at straight time if announced at the commencement of the project. See PLA Article 12, Section 1. This is an example where the terms of the PLA override provisions of the Standard Construction Contract (compare with section 37.2 of the Standard Construction Contract).

Q13. Does the PLA create a common holiday schedule for all the signatory trades?

A. Yes, the PLA recognizes eight (8) common holidays. See PLA Article 12, Section 4.

Q14. Does the PLA provide for a standard policy for 'shift work' across all signatory trades?

A. Yes, second and third shifts may be worked with a standard 5% premium pay. In addition, a day shift does not have to be scheduled in order to work the second and third shifts at the 1.05 hourly pay rate. See PLA Article 12, Section 3.

Q15. May the Contractor schedule overtime work, including work on a weekend?

A. Yes, the PLA permits the Contractor to schedule overtime work, including work on the weekends. See PLA Article 12, Sections 2, 3, and 5. To the extent that the Agency's approval is required before a Contractor may schedule or be paid for overtime, that approval is still required notwithstanding the PLA language.

Q16. Are overtime payments affected by the PLA?

A. Yes, all overtime pay incurred Monday through Saturday will be at time and one half (1 ½). There will be no stacking or pyramiding of overtime pay under any circumstances. See PLA Article 12, Section 2. Sunday and holiday overtime will be paid according to each trades CBA.

A contact list for the participating unions is set forth after the FAQs.

Below are answers to frequently asked questions (FAQs) about this PLA:

Q1. Does a contractor need to be signatory with the unions in the NYC Building and Construction Trades Council in order to bid on projects under the PLA?

A. No, any contractor may bid by signing and agreeing to the terms of the PLA. The contractor need not be signatory with these unions by any other labor agreement or for any other project.

Q2. Does a contractor agreeing to the PLA and signing the Letter of Assent create a labor agreement with these unions outside of the project covered by the PLA?

A. No, the PLA applies only to those projects that the Contractor agrees to perform under the PLA and makes no labor agreement beyond those projects.

Q3. Does the PLA affect the subcontractors that a bidder may utilize on the project?

A. Subject to the Department's approval of subcontractors pursuant to Article 17 of the Standard Construction Contract, a contractor may use any subcontractor, union or non-union, as long as the subcontractor signs and agrees to the terms of the PLA.

Q4. Are bidders required to submit Letters of Assent signed by proposed subcontractors with their bid in order to be found responsive?

A. No, bidders do not have to submit signed Letters of Assent from their subcontractors with their bid. Subcontractors, however, will be required to sign the letter of Assent prior to being approved by the Department.

Q5. May a contractor or subcontractor use any of its existing employees to perform this work?

A. Generally labor will be referred to the contractor from the respective signatory local unions. See PLA Article 4. However, contractors and subcontractors may continue to use up to 12% of their existing, qualifying labor force for this work, in accordance with the terms of PLA Article 4, Section 2B. Certified MWBEs for which participation goals are set pursuant to NYC Administrative Code §6-129 that are not signatory to any Schedule A CBAs may use their existing employees for the 2nd, 4th, 6th and 8th employee needed on the job if their contracts are valued at or under \$500,000. For contracts valued at above \$500,000 but under \$1,000,000, such certified MWBEs may use their own employees for the 2nd, 5th and 8th employees needed on the job in accordance with the provisions of PLA Article 4, Section 2C. If additional workers are needed by these MWBEs, the additional workers will be referred to the contractor from the signatory local unions subject to the contractor's right to meet 12% of the additional needs with its existing, qualifying employees.

Q6. Must the City set MWBE participation goals for the particular project or contract in order for a certified MWBE to utilize the provisions of PLA Article 4, Section 2C?

A. No. PLA Article 4, Section 2(C) specifies what categories of MWBEs are eligible to take advantage of this provision (i.e., those MWBEs for which the City is authorized to set participation goals under §6-129). For purposes of section 2(C), it is not necessary for the project to be subject to §6-129 or for the City to have actually set participation goals for the particular contract or project. The result is the same where a projects receives State funding and therefore is subject to the requirements of Article 15-A of the Executive Law.

Q7. May a contractor bring in union members from locals that are not signatory unions?

A. Referrals will be from the respective signatory locals and/or locals listed in schedule A of the PLA. Contractors may utilize 'traveler provisions' contained in the local collective bargaining agreements (local CBAs) where such provisions exist and/or in accordance with the provisions of PLA Article 4, Section 2.

Q8. Does a non-union employee working under the PLA automatically become a union member?

CONTACT INFORMATION FOR LOCAL UNIONS

BOILER MAKERS LOCAL NO. 5

24 Van Siclen Avenue
Floral Park, NY 11001
Phone: (516) 326-2500
Fax: (516) 326-3435
Thomas Klein, Bus. Mgr.
boilermakers5@optonline.net

BLASTERS & DRILLERS LOCAL NO. 29

43-12 Ditmars Blvd.
Astoria, NY, 11105
Phone: (718) 278-5800
Thomas Russo, bus mgr.

BRICKLAYERS LOCAL NO. 1

Santo Lanzafame (718) 392-0525

BUILDING TRADES

71 West 23rd Street, Suite 501
New York, NY 10010
Phone: (212) 647-0700
Fax: (212) 647-0705
John Barnett, Chairman

CARPENTERS DISTRICT COUNCIL

395 Hudson Street
New York, New York 10014
Phone: (212) 366-7500
Fax: (212) 675-3140
Michael J. Forde, Executive Secy Treas.
Peter Thomassen, President
Denis Sheil, V.P.
Ronald Rawald, D.C. Rep.
carpmik@aol.com

CEMENT MASONS NO. 780

150-42 12th Avenue
Whitestone, NY 11357
Phone: (718) 357-3750
Fax: (718) 357-2057
Angelo Scagnelli, Bus. Mgr.
Paul M. Mantia, President
Angelolocal780@yahoo.com

CONCRETE WORKERS DISTRICT COUNCIL NO. 16

29-18 35th Avenue
Long Island City, NY 11106
Phone: (718) 392-5077
Fax: (718) 392-5087
Alex Castaldi, Pres. Bus. Mgr.
Ccwdc16@yahoo.com

DERRICKMEN AND RIGGERS CONCRETE WORKERS

25-19 43rd Avenue
Long Island City, NY 11101
Phone: (718) 361-6534

Fax: (718) 361-6584
Joseph McDonald, Bus. Agent
joemac197@aol.com

DRYWALL TAPERS 1974

265 West 14th Street
New York, NY 10011
Phone: (212) 242-8500
Fax: (212) 242-2356
Joseph Giordano, Bus. Mgr.
Salvatore Marsala, Org.
Maurice Maynard, Org.
Ellior Santiago, Org.
Vincent Calderone, Org.
Ann Juliano Union Sec.
Local1974@aol.com

ELECTRICAL LOCAL NO. 3

158-11 Harry Van Arsdale, Jr. Avenue
Flushing, NY 113656
Phone: (718) 591-4000
Fax: (718) 380-8998
Christopher Erikson, Bus. Mgr.
John E. Marchell, President
Raymond Melville, Asst. Bus. Mgr. Construction
Paul Ryan, Asst. Bus. Mgr. Westchester/Fairfield
Luis Restrepo, Asst. Bus. Mgr.
Mark G. Hansen, Bus. Rep.
Elliot Hecht, Bus. Rep.
Raymond Kitson, Bus. Rep.
Austin McCann, Bus. Rep.
Robert Olenick, Bus. Rep.
Michael O'Neill, Bus. Rep.
Joseph Santigate, Bus. Rep.
Louis Sciarra, Bus. Rep.
Lance Van Arsdale, Asst. Bus. Maintenance Division
Ray West, Bus. Rep.
mail@local3ibew.org

ELEVATOR CONSTRUCTORS NO. 1

47-24 27th Avenue
Long Island City, NY 11101
Phone: (718) 767-7004
Fax: (718) 767-6730
Lenny Legotte, Pres. Bus. Mgr.
Thomas Moore, Bus. Agent
Gary Riefenhauser, Bus. Agent
Fred McCourt, Bus. Agent
Robert Stork, Bus. Agent
llegotte@localoneiuec.com
snoble@localoneiuec.com

ENGINEERS NO. ENGINEERS LOCAL UNION NO. 14

141-57 Northern Boulevard
Flushing, NY 11354
Phone: (718) 939-0600
Fax: (718) 939-3131
Edwin Christian, Pres. Bus. Mgr.

John O'Connell, Bus. Agent
Richard Roberts, Bus. Agent At-Large
Patrick Dolan Jr., Bus. Agent
Brian Wangerman, Bus. Agent
Robert Egan Jr., Bus. Agent
Vincent Curran Jr., Bus. Agent
Patrick Daly, Bus. Agent
Raymond Dean Jr., Bus. Agent
Scott Roche, Bus. Agent
Patrick Norton, Bus. Agent
Robert Bartels, Jr. Bus. Agent
Christopher P. Sheeran, Bus. Agent
bpetriccione@steamfitters638.org
rroberts@steamfitters638.org

TEAMSTERS LOCAL UNION 282

2500 Marcus Avenue
Lake Success, NY 11042
Phone: (516) 488-2822
Fax: (516) 488-4895
Thomas Gesualdi
Kpalmeri282@yahoo.com

TEAMSTERS LOCAL UNION 814

33-01 38TH Avenue
Long Island City, NY 11101
Phone: (718) 392-4510
Fax: (718) 361-9610
George Daniello, Pres., Bus. Mgr.
team814@hotmail.com

TILE, MARBLE & TERRAZO B.A.C. LOCAL UNION 7

45-34 Court Square
Long Island City, NY 11101
Phone: (718) 786-7648
Fax: (718) 472-2370
Thomas Lane, President Bus. Mgr.
William Hill, Bus. Agent
Blaise Toneatto, Bus. Agent
Christopher Guy, Sec. Treasurer
Ernesto Jimenez, Bus. Agent
Joseph Andriano, Bus. Agent
Ronald Nicastrì, Bus. Agent
James Ghan, Bus. Agent
tlane@baclocal7.com

TIMBERMEN LOCAL 1536

395 Hudson Street, 8th Floor
New York, NY 10014
Phone: (212) 366-7500
Samuel Bailey, Bus. Mgr.

Kevin Brady Sr., Bus. Agent
Donald Doherty Jr. Bus. Agent at Large
Dudley Kinsley, Bus. Agent
Michael Apuzzo, Bus. Agent
John Feeney Jr., Bus. Agent
Paul O'conner, Bus. Agent
Anthony Russini, Bus. Agent
John Murphy, Fin. Sec. Treasurer
Fred Delligatti, Bus. Agent
Thomas Kemps, Bus. Agent
plunyny@aol.com

PRIVATE SANITATION LOCAL NO. 813

45-18 Court Sq., Suite 600
Long Island City, NY 11101
Phone: (718) 937-7010
Fax: (718) 937-7003
Anthony Marino, President

ROOFERS & WATERPROOFERS NO. 8

467 Dean Street
Brooklyn, NY 11217
Phone: (718) 857-3500
Fax (718) 398-8359
Thomas Pedrick, Trustee & Int'l V.P.
Nicolas Siciliano, Bus. Agent

SHEET METAL WORKERS LOCAL NO. 28

MANHATTAN OFFICE
500 Greenwich Street
New York, NY 10013
Phone: (212) 226-941-7700
Fax: (212) 226-0304
Brian McBreaty, Bus. Agent
Richard Knice, Fin. Sec-Treas.
Michael Belluzzi, Bus. Mgr. & Pres.
Kevin McPike, Bus. Agent
Daniel Fox Jr., Bus. Agent
Rick Buckheit, Bus. Agent
Robert Rotolo, Bus. Mgr.
joanne@local28union.com

SHEET METAL WORKERS LOCAL 137

21-42 44th Drive
Long Island City, NY 11101
Phone: (718) 937-4514
Fax: (718) 937-4113
Paul Collins Jr.
Dante Dano, Agent

STEAMFITTERS LOCAL UNION NO. 638

32-32 48th Avenue
Long Island City, NY 11101
Phone: (718) 392-3420
Fax: (718) 784-7285
John Torpey, Pres.-Fax: (718) 372-5340
James Elder, Sec. Treasurer
John Enright, Bus. Agent

Peter Creegan, Bus. Agent
dlusardi@local-580.com

PAINTERS DISTRICT COUNCIL NO. 9

45 West 14th Street
New York, NY 10011
Phone: (212) 255-2950
Fax: (212) 255-1151
William Elfeld, President
Gerard O'Brien, Bus. Rep.
Greg Coords, Bus. Rep.
Richard Small, Bus. Rep.
Jose Torent, Bus. Rep.
Raul Rendon, Bus. Rep.
Paul Belliveau, Bus. Rep.
Joseph Ramaglia, Bus. Mgr.
Anthony Buscema, Bus. Rep.
James Barnett, Bus. Rep.
Angelo Serse, Bus. Rep.
Jack Kittle, Political Dir.
Gus Diamantas, Training Director
John Barrett, Bus. Rep.

PAINTERS STRUCTURAL STEEL NO. 806

40 West 27th Street
New York, New York 10001
Phone: (212) 447-1838, 0149
Fax: (212) 545-8386
Angelo Serse, Bus. Mgr.

PAVERS & ROAD BUILDERS DISTRICT COUNCIL NO. 1

136-25 37th Avenue, Suite 502
Flushing, NY 11354
Phone: (718) 779-8850
Fax: (718) 779-8857
Keith Loscalzo, Bus. Mgr.
Vincent Masino, Trustee
Lowell Barton, Bus. Agent
Francisco Fernandez, Bus. Agent
Joao Teixeira, Bus. Agent
Bonaventura Valerio, Bus. Agent
Joseph Sarro, Bus. Agent

PLASTERS LOCAL UNION NO. 262

2241 Conner Street
Bronx, NY 10466
Phone: (718) 547-5440
Fax: (718) 547-5435
John Sweeney, Int'l Rep.
mventura@opcmllocal262.com

PLUMBERS NO. 1

158-29 Bross Bay Boulevard
Howard Beach, NY 11414
Phone: (718) 738-7500
Fax: (718) 835-0896
George Reilly, Bus. Mgr.
Daniel Lucarelli, Bus. Agent
PLA-Union Contact List_rev

Luis Pereria, Bus Agent
Noe Duran, Bus. Agent
Timothy Campbell, Bus. Agent
John Wund, Agent, Organizer
79@laborerslocal.org

LABORERS NO. 731

34-11/19 35th Avenue
Astoria, NY 11106
(718) 706-0720
Joseph D'Amato, Bus. Mgr.

LATHERS METAL LOCAL NO. 46

1322 Third Avenue
New York, NY 10021
Phone: (212) 737-0500
Fax: (212) 249-1226
Robert Ledwith, Bus. Mgr.
Terence Moore, Bus. Agent
Kenneth Allen, Bus. Agent
Fred LeMoine Jr., Bus. Agent
Kevin Kelly, Bus. Agent

MASON TENDERS DIST. COUNCIL

520 8th Avenue
New York, NY 10018
Phone: (212) 452-9400
Fax: (212) 452-9499
Robert Bonanza, Bus. Mgr.
David Bolger, Field Rep.

METAL POLISHERS LOCAL UNION NO. 8A

36-18 33rd Street 2nd Fl.
Long Island City, 11106
Phone: (718) 361-1770
Fax: (718) 361-1934
Hector Lopez, Bus. Mgr., Pres.

METAL TRADES DIVISION

Kevin Connelly, Bus. Agent
21-42 44th Drive

MILLWRIGHT AND MACHINERY ERECTORS LOCAL NO. 740

89-07 Atlantic Avenue
Woodhaven, NY 11412
Phone: (718) 849-3636
Fax: (718) 849-0070
Robert Seeger, Bus. Mgr.

ORNAMENTAL IRON WORKERS NO. 580

501 West 42nd Street
New York, NY 10036
Phone: (212) 594-1662
Fax: (212) 564-2748
Dennis Lusardi, Bus. Mgr.
James Mahoney, Bus. Agent
Robert Benesh, Bus. Agent
Dennis Milton, Bus. Agent

IRON WORKERS DISTRICT

505 White Plains Road, Suite 200
Tarrytown, NY 10591
Phone: (914) 332-4430
Fax: (914) 332-4431
Edward J. Walsh, Pres.
ironworkdc@aol.com

IRON WORKERS NO. 40

451 Park Avenue South
New York, NY 10016
Phone: (212) 889-1320
Fax: (212) 779-3267
Robert Walsh, Bus. Mgr. Fin. Sec.
Daniel Doyle, Bus. Rep. V.P.
Kevin O'Rourke, Pres. Bus. Agent

IRON WORKERS NO. 361

89-19 97TH Avenue
Ozone Park, NY 11416
Phone: (718) 332-1016-17
Fax: (718) 322-1053
Matthew Chartrand, Pres. Bus. Agent
Richard O'Kane, Bus. Mgr. Fin. Sec.
Thomas Seaman, President
Anthony DeBlaisie, Bus. Agent, V.P.
John Delaney, Jr., Rec. Sec.
unionhall@361.com

LABORERS LOCAL NO. 78 ASBESTOS & LEAD ABATEMENT

30 Cliff Street
New York, New York 10038-2825
Phone: (212) 227-4805
Fax: (212) 406-1800
Kazik Prosniewski, Pres.
Edison Severino, Bus. Mgr.
Pawel Gruchacz, Sec. Treas.
Local78dispatchers@gmail.com

LABORERS, CONSTRUCTION AND GENERAL BUILDING NO. 79

520 8th Avenue
New York, NY 10018
Phone: (212) 465-7900
Fax: (212) 465-7903
Kenneth Brancaccio, President
John Delgado, Bus. Mgr.
George Zecca, Bus. Mgr.
John Norbury, V.P. & Bus. Agent
Chas Rynkiewicz, Organizer, Mk Dev.
Eugene Sparano, Organizer Mkt. Dev.
John Modica, Bus. Agent
Joseph Cangelosi, Bus. Agent
Kenny Robinson, Bus. Agent
James Haggerty, Bus. Agent
Carl Tully, Bus. Agent
Jose Andino, Bus. Agent
Edward Medina, Bus. Agent

Christopher Confrey, Bus. Rep. Rec Sec.
John R. Powers, Bus. Rep. Treas.
engineers@iuoelocal14.com

ENGINEERS NO. 15, 15A, 15B, 15C, 15D

265 West 14th Street
New York, NY 10011
Phone: (212) 929-5327-8-9
Fax: (212) 206-0357
James T. Callahan, Pres. & Bus. Mgr.
Robert G. Shaw, Bus. Rep. & V.P.
Charles Gambino, Bus. Rep., Fin. Sec.
Brian S. Kelly, Bus. Rep. & Rec. Sec.
Daniel Schneider, Bus. Rep. & Treasurer
Gregg Nolan, Bus. Rep.
Christopher Thomas, Bus. Rep.
Bruce Murphy, Director of Training

ENGINEERS NO. 30

115-06 Myrtle Avenue
Richmond Hill, NY 11418
Phone: (718) 847-8484
Fax: (718) 850-0524
John T. Ahern, Bus. Mgr.

ENGINEERS No. 94

331-337 West 44th Street
New York, NY 10036
Phone: (212) 245-7040 Fax: (212) 245-7886
Kuba Brown, Bus. Mgr. & President
kubabrown@local94.com

GLAZERS NO. 1281

45 West 14th Street
New York, NY 10011
Phone: (212) 924-5200
Fax: (212) 255-1151
William Elfeld, Bus. Rep.

HEAT & FROST INSULATORS AND ASBESTOS WORKERS LOCAL UNION NO. 12

25-19 43rd Avenue
Long Island City, NY 11101
Phone: (718) 784-3456
Fax: (718) 784-8357
Joseph Lapinski, Bus. Agent
Nick Grgas, Bus. Agent
Matthew Aracick, Fin. Sec.
John Killard, President
Dennis Ippolito, Bus. Mgr.
matty@insulatorslocal12.com
dennis@insulators.org

HEAT FROST INSULATORS LOCAL UNION NO. 12A

2110 Newton Avenue
Astoria, NY 11102
Phone: (718) 937-3203
Fax: (718) 482-8722
Francisco Vega, Bus. Mgr.



TO: David J Burney, FAIA, Commissioner, Dept. of Design and Construction

FROM: Andrea Glick, Director, Mayor's Office of Contract Services *Andrea Glick*
David Resnick, Deputy Commissioner, Public Buildings Division, DDC *DR*

RE: Report and Recommendation on Proposed Project Labor Agreement for Specified New EMS Construction Project at Queens General Hospital campus in Jamaica, Queens.

DATE: March 20, 2013

This is in regard to the proposed Project Labor Agreement (PLA) for the construction of a new EMS station at Queens General Hospital campus in Jamaica, Queens. Based on the findings contained in the attached report, we recommend that the City execute this New Construction PLA.

The City conducted negotiations with the Building and Construction Trades Council (BCTC) and their local unions with the objective of ascertaining whether a PLA could be reached which would provide more favorable and cost effective terms and conditions than would otherwise likely prevail for the City's construction of this new EMS facility at Queens General Hospital campus in Jamaica, Queens. The City entered the negotiations with the assumption that, in order to be acceptable, a PLA should provide the best opportunity for obtaining the best work at the lowest possible price; prevent favoritism, fraud and corruption; and otherwise benefit the covered projects and the City by minimizing the costs of delay and providing the possibility for substantial cost savings. Specifically, the City's objective was to negotiate a PLA that could (1) provide economic benefits to the City through concessionary changes in work rules and practices and/or other terms and conditions, the standardization of work hours and the widest



possible flexibility in scheduling; (2) provide protection from increased costs and scheduling delays due to labor disputes and disruptions; and (3) secure relief pursuant to Labor Law 222, where otherwise appropriate, from the costs associated with Wicks Law compliance.

Furthermore it was critical that any negotiated PLA provide that all successful bidders, including open-shop contractors, be allowed equal access to covered work and the PLA and that they be able to utilize a portion of their regular work force for work on the project.

The Mayor's Office of Contract Services led the negotiations with assistance from the Law Department and the Department of Design and Construction.

The Department of Design and Construction (DDC), the City agency with broad responsibility for conducting and overseeing the City's construction, is the agency that will be responsible for overseeing this project under the proposed New Construction PLA. DDC retained LiRo Program and Construction Management, P.C. ("LiRo") to conduct an independent economic analysis of the impact of the New Construction PLA on this project. LiRo has recognized expertise in the construction of major projects Citywide. The result of the independent assessment indicates that the City should reasonably expect savings of at least \$450,000 or 4.29% of total project costs through the use of the New Construction PLA, in addition to other benefits that, although harder to quantify, are nonetheless real. The savings projections are set forth in detail in the attached report.

RECOMMENDATION

We are familiar with the with the proposed PLA and its terms. Based upon the report and expertise of our independent consultant (LiRo), and upon our own experience and judgment, and the conclusion that this PLA meets the criteria set out in Section 222 of the Labor Law, we recommend that DDC execute the PLA.

c: John Spavins
David Varoli
Steven Stein Cushman

List of Signatory Unions

Blasterers and Drillers Local #29

Bricklayers Local No. 1

Boiler Makers Local No. 5

Carpenters District Council

Cement Masons No. 780

Derrickmen and Riggers Union No. 197

Concrete Workers District Council No. 16, including Cement and Concrete Workers Nos. 6-A, 18-A, and 20

Electrical Local No. 3

Drywall Tapers 1974

Elevator Constructors No. 1

Heat & Frost Insulators Local Union No. 12A

Heat & Frost Insulators Local Union No. 12

Iron Workers No. 40

Iron Workers District Council

Laborers Local No. 78 Asbestos & Lead Abatement

Iron Workers No. 361

Laborers Construction and General Building No. 79

Laborers Local 731

Lathers Metallic Local No. 46

Local Union 8A Glaziers No. 1281

Mason Tenders District Council

Metal Polishers DC 9

Painters District Council No. 9

Painters Structural Steel No. 806

Ornamental Iron Workers No. 580

Plasters Local Union No. 262

Pavers & Road Builders District Council No. 1

Plumbers No. 1

Sheet Metal Workers Local No. 28

Roofers & Waterproofers No. 8

Sheet Metal Workers Local No. 137

Steamfitters Local Union No. 638; including Metal Trades Division

Teamsters Local Union 813

Teamsters Local Union 814

Tile, Marble & Terrazzo B.A.C. Local Union No. 7

PLA Schedule A

The following Collective Bargaining Agreements, as this Schedule may be amended from time to time in accordance with the Agreement, constitute Schedule A:

- (1) Agreement between the Boilermakers Association of Greater New York, Inc. and the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers AFL-CIO, Lodge No. 5, September 1, 2006 - December 31, 2009.
- (2) Agreement between Association of Cement and Concrete Contractors of New York, Inc. and Cement and Concrete Workers comprised of Local No. 6A, Local No. 18A, Local No. 20 and the Employer, July 1, 2008 - June 30, 2011.
- (3) Agreement between the Cement League and the District Council of Cement and Concrete Workers; Comprised of Local No. 6A, Local No. 18A, Local No. 20; July 1, 2008 - June 30, 2011.
- (4) Agreement between the Cement League and the United Cement Masons' Union Local No. 780, Clarified & Extended from October 23, 1940 to June 30, 2011.
- (5) Building Construction agreement between the Building Contractors Association, Inc. and the District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO, July 1, 2006 - June 30, 2011.
- (6) General Contractors Association - Carpenters 2006; Agreement Between Members of the General Contractors Association of New York, Inc. and the District Council of Carpenters of New York City and Vicinity, July 1, 2006 - June 30, 2011.
- (7) Trade Agreement between Drywall Tapers and Pointers of Greater New York Local Union 1974, affiliated with International Union of Painters and Allied Trades, AFL-CIO and Drywall Taping Contractors' Association of Greater New York and the Association of Wall-Ceiling & Carpentry Industry of New York, Inc., September 6, 2006 - June 28, 2011; Independent Agreement between Local Union 1974 and Employer.
- (8) Agreement between Allied Building Metal Industries, Inc. and Local Union Nos. 40 and 361 of the International Association of Bridge, Structural and Ornamental and Reinforcing Iron Workers AFL-CIO, July 1, 2008 - June 30, 2014.
- (9) Agreement between Independent Contractors and Local #46 Metallic Lathers Union and Reinforcing Ironworkers of New York and Vicinity of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, July 1, 2008 - June 30, 2014.
- (10) Agreement of Working Conditions between the Independent Insulation Contractors Association of New York City Inc. and the International Association of Heat and Frost Insulators and Asbestos Workers Local No. 12 of New York City, 2008-2014.

- (11) Mason Tenders District Council of Greater New York Master Independent Collective Bargaining Agreement, 2008-2011.
- (12) Trade Agreement between District Council No. 9, International Union of Painters and Allied Trades, AFL-CIO and the Association of Master Painters and Decorators of New York, Inc. and the Association of Wall, Ceiling & Carpentry Industries of New York, Inc. and the Window and Plate Glass Dealers Association, May 1, 2005 - April 30, 2011.
- (13) Trade Agreement between Enterprise Association Local Union 638 and Mechanical Contractors Association of New York, Inc., July 1, 2008 - June 30, 2011.
- (14) Agreement between Allied Building Metal Industries Inc. and Architectural and Ornamental Iron Workers Local Union No. 580 AFL-CIO; July 1, 2008 - June 30, 2011.
- (15) Official Working Agreement between Service Contractors Division of the Mechanical Contractors Association of New York and Enterprise Association Metal Trades Branch Local Union 638, July 1, 2007 - June 30, 2010.
- (16) Agreement between Association of Contracting Plumbers of the City of New York, Inc. and Local Union No 1 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, July 1, 2007 - June 30, 2010.
- (17) Agreement and Working Rules between New York Electrical Contractors Association, Inc. and the Association of Electrical Contractors, Inc. and Local Union No. 3 International Brotherhood of Electrical Workers, AFL-CIO, May 10, 2007 - May 13, 2010.
- (18) Official Working Agreement between Service Contractors Division of the Mechanical Contractors Association of New York, Inc. and Enterprise Association Metal Trades Branch Local Union 638, Refrigeration, Air Conditioning, Air Cooling, Oil Burner and Stoker Service and Maintenance Technicians, July 1, 2007 - June 30, 2010.
- (19) Structural Steel and Bridge Painters of Greater New York, Local Union No. 806, District Council No. 9, International Union of Painters and Allied Trades, AFL-CIO, CLC and New York Structural Steel Painting Contractors Association, Inc.; Collective Bargaining Agreement, October 1, 2005 - September 30, 2011.
- (20) Trade Agreement between United Derrickmen & Riggers Association, Local No. 197 of New York, All long Island, Westchester and Vicinity and Building Stone and Pre-Case Contractors Association, 2008.
- (21) Agreement between the Greater New York and New Jersey Tile Contractors Association, Inc., and the Tile Setters and Tile Finishers Union of New York and New Jersey, Local Union No. 7 of the International Union of Bricklayers and Allied Craftworkers, June 8, 2009 - June 2, 2013.

- (22) Agreement between The Building Contractors Association, Inc. and International Union of Operating Engineers Local 15 and 15 A, July 1, 2006-June 30, 2011.
- (23) Agreement dated as of July 1, 2006 between Building Contractors Association and International Union of Operating Engineers Local 14-14B, July 1, 2006-June 30, 2011.
- (24) Agreement Between The Building Contractors Association, Inc. and International Union of Operating Engineers Local 15D affiliated with the AFL-CIO, July 1, 2006-June 30, 2011.
- (25) Local 282 International Brotherhood of Teamsters High Rise Contract, Building Contractors Association and Independents, 2008-2013.
- (26) Building, Concrete, Excavation & Common Laborers Union Local No. 731 Independent Agreement, July 1, 2006-June 30, 2012.
- (27) March 17, 2009 Agreement between ThyssenKrupp Elevator Corp. and International Union of Elevator Constructors, Local 1 of NY and NJ, 2009-2014.
- (28) Working Agreement Local Union No. 8 United Union of Roofers, Waterproofers and Allied Workers and Roofing and Waterproofing Contractor's Association of New York and Vicinity, July 1, 2009-June 30, 2011.
- (29) Standard Form Collective Bargaining Agreement between Sheet Metal Workers' International Association Local Union #137 and the Greater New York Sign Association, July 16, 2007 – July 15, 2010.
- (30) Trade Agreement between _____ and Local No. 1 New York of the International Union of Bricklayers and Allied Craftworkers, July 1, 2008 – July 30, 2011.

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NYC AGENCY RENOVATION & REHAB CITY OWNED BUILDINGS/STRUCTURES

Project Labor Agreement - - Letter of Assent

Dear:

The undersigned party confirms that it agrees to be a party to and be bound by the New York Agency, Project Labor Agreement as such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Project Labor Agreement, its Schedules, Addenda and Exhibits are hereby incorporated by reference herein.

The undersigned, as a Contractor or Subcontractor (hereinafter Contractor) on the Project known as _____ and located at _____ (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECT, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

- (1) Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all schedules; amendments and supplements now existing or which are later made thereto.
- (2) Agrees to be bound by the legally established collective bargaining agreements and local trust agreements as set forth in the Project Labor Agreement and this Agreement but only to the extent of Program Work and as required by the PLA.
- (3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor but only to the extent of Program Work as required by the PLA.
- (4) Certifies that it has no commitments or agreements that would preclude its full and complete compliance with the terms and conditions of said Agreement. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it has engaged or may engage to work on the Project. Labor harmony disputes/issues shall be subject to the Labor Management Committee provisions.
- (5) Agrees to secure from any Contractor(s) (as defined in said Agreement) which is or becomes a Subcontractor (of any tier), to it, a duly executed Agreement to be Bound in from identical to this document.

Dated: _____

(Name of Contractor or subcontractor)

(Name of CM; GC; Contractor or
Higher Level Subcontractor)

(Authorized Officer & Title)

(Address)

(Phone) (Fax)

Contractor's State License

Sworn to before me this
____ day of _____, 2009

Notary Public

STANDARDS OF EXCELLENCE

The purpose of this Standard of Excellence is to reinforce the pride of every construction worker and the commitment to be the most skilled, most productive and safest workforce available to construction employers and users in the City of New York. It is the commitment of every affiliated local union to use our training and skills to produce the highest quality work and to exercise safe and productive work practices.

The rank and file members represented by the affiliated local unions acknowledge and adopt the following standards:

- *Provide a full days work for a full days pay;*
- *Safely work towards the timely completion of the job;*
- *Arrive to work on time and work until the contractual quitting time;*
- *Adhere to contractual lunch and break times;*
- *Promote a drug and alcohol free work site;*
- *Work in accordance with all applicable safety rules and procedures;*
- *Allow union representatives to handle job site disputes and grievances without resort to slowdowns, or unlawful job disruptions;*
- *Respect management directives that are safe, reasonable and legitimate;*
- *Respect the rights of co-workers;*
- *Respect the property rights of the owner, management and contractors.*

The Unions affiliated with the New York City Building and Construction Trades Council will expect the signatory contractors to safely and efficiently manage their jobs and the unions see this as a corresponding obligation of the contractors under this Standard of Excellence. The affiliated unions will expect the following from its signatory contractors:

- *Management adherence to the collective bargaining agreements;*
- *Communication and cooperation with the trade foremen and stewards;*
- *Efficient, safe and sanitary management of the job site;*
- *Efficient job scheduling to mitigate and minimize unproductive time;*
- *Efficient and adequate staffing by properly trained employees by trade;*
- *Efficient delivery schedules and availability of equipment and tools to ensure efficient job progress;*
- *Ensure proper blueprints, specifications and layout instructions and material are available in a timely manner*
- *Promote job site dispute resolution and leadership skills to mitigate such disputes;*
- *Treatment of all employees in a respectful and dignified manner acknowledging their contributions to a successful project.*

The affiliated unions and their signatory contractors shall ensure that both the rank and file members and the management staff shall be properly trained in the obligations undertaken in the Standard of Excellence.

NOTICE TO BIDDERS

DAMAGES FOR DELAY PILOT PROGRAM

Please be advised that this contract is part of a pilot program in which the Standard Construction Contract provisions concerning delay damages have been revised to allow contractors to be reimbursed for specified additional costs that are attributable to a delay in the performance of the work resulting from certain acts or omissions of the City agency or its representatives. Certain changes are highlighted here to alert bidders to the pilot program. Please see Articles 11, 12.3, and 13.10 of the Standard Construction Contract for a full understanding and the actual text of the pilot program. The text of the revised Standard Construction Contract is the controlling document should there be any discrepancies between this notice and the Standard Construction Contract.

Changes to Articles 11, 12.3, and 13.10 of the Standard Construction Contract permit contractors to make claims for delay damages relating to the following circumstances:

The failure of the City to take reasonable measures to coordinate and progress the Work;

Extended delays attributable to the City in the review or issuance of change orders, in shop drawing reviews and approvals or as a result of the cumulative impact of multiple change orders, which constitute a material change to the Work and which have a verifiable impact on project costs.

The unavailability of the site for an extended period of time that significantly affects the scheduled completion of the contract.

The issuance by the City of a stop work order relative to a substantial portion of work for a period exceeding thirty days, that was not brought about through any action or omission of the Contractor.

Differing site conditions that were not known or reasonably ascertainable on a pre-bid inspection of the site or review of the bid documents or other publicly available sources and that are not ordinarily encountered in the Project's geographical area or neighborhood or in the type of work to be performed.

Delays caused by the City's bad faith or its willful, malicious, or grossly negligent conduct;

Delays not contemplated by the parties;

Delays so unreasonable that they constitute an intentional abandonment of the Contract by the City; and

Delays resulting from the City's breach of a fundamental obligation of the Contract.

Please see Article 11.4 for provisions regarding compensable delays.

Specific exclusions to claims for damages also apply, such as for third party (non-City) acts and omissions, court orders, strikes or *force majeure* events. For provisions related to non-compensable delays, please see Article 11.5.

For those delays where damages are available, Article 11 also sets forth what costs are recoverable. Please see Article 11.7 for which costs are recoverable and which costs are non-recoverable.

Article 11 also contains provisions concerning notice and documentation of claims. Please see Articles 11.1, 11.2, and 11.6. Contractors must comply with the notice requirements in order to preserve their claims. Consequently, please read these sections carefully. Delay damages are compensable only if they were actually, reasonably and necessarily incurred and are verified by appropriate documentation submitted at the appropriate times.

Claims for delay damages are not covered by the dispute resolution process in Article 27 of the Standard Construction Contract. See Article 11.8. When the amount of delay damages are agreed upon, such damages may be paid through a change order.

NOTICE TO BIDDERS, PROPOSERS, CONTRACTORS, AND RENEWAL CONTRACTORS

This contract includes a provision concerning the protection of employees for whistleblowing activity, pursuant to New York City Local Law Nos. 30-2012 and 33-2012, effective October 18, 2012 and September 18, 2012, respectively. The provisions apply to contracts with a value in excess of \$100,000.

Local Law No. 33-2012, the Whistleblower Protection Expansion Act ("WPEA"), prohibits a contractor or its subcontractor from taking an adverse personnel action against an employee or officer for whistleblower activity in connection with a City contract; requires that certain City contracts include a provision to that effect; and provides that a contractor or subcontractor may be subject to penalties and injunctive relief if a court finds that it retaliated in violation of the WPEA. The WPEA is codified at Section 12-113 of the New York City Administrative Code.

Local Law No. 30-2012 requires a contractor to prominently post information explaining how its employees can report allegations of fraud, false claims, criminality, or corruption in connection with a City contract to City officials and the rights and remedies afforded to employees for whistleblowing activity. Local Law No. 30-2012 is codified at Section 6-132 of the New York City Administrative Code.

WHISTLEBLOWER PROTECTION EXPANSION ACT RIDER

1. In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the New York City Administrative Code, respectively,
 - (a) Contractor shall not take an adverse personnel action with respect to an officer or employee in retaliation for such officer or employee making a report of information concerning conduct which such officer or employee knows or reasonably believes to involve corruption, criminal activity, conflict of interest, gross mismanagement or abuse of authority by any officer or employee relating to this Contract to (i) the Commissioner of the Department of Investigation, (ii) a member of the New York City Council, the Public Advocate, or the Comptroller, or (iii) the City Chief Procurement Officer, ACCO, Agency head, or Commissioner.
 - (b) If any of Contractor's officers or employees believes that he or she has been the subject of an adverse personnel action in violation of subparagraph (a) of paragraph 1 of this rider, he or she shall be entitled to bring a cause of action against Contractor to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (i) an injunction to restrain continued retaliation, (ii) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (iii) reinstatement of full fringe benefits and seniority rights, (iv) payment of two times back pay, plus interest, and (v) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.
 - (c) Contractor shall post a notice provided by the City in a prominent and accessible place on any site where work pursuant to the Contract is performed that contains information about:
 - (i) how its employees can report to the New York City Department of Investigation allegations of fraud, false claims, criminality or corruption arising out of or in connection with the Contract; and
 - (ii) the rights and remedies afforded to its employees under New York City Administrative Code sections 7-805 (the New York City False Claims Act) and 12-113 (the Whistleblower Protection Expansion Act) for lawful acts taken in connection with the reporting of allegations of fraud, false claims, criminality or corruption in connection with the Contract.
 - (d) For the purposes of this rider, "adverse personnel action" includes dismissal, demotion, suspension, disciplinary action, negative performance evaluation, any action resulting in loss of staff, office space, equipment or other benefit, failure to appoint, failure to promote, or any transfer or assignment or failure to transfer or assign against the wishes of the affected officer or employee.
 - (e) This rider is applicable to all of Contractor's subcontractors having subcontracts with a value in excess of \$100,000; accordingly, Contractor shall include this rider in all subcontracts with a value a value in excess of \$100,000.
2. Paragraph 1 is not applicable to this Contract if it is valued at \$100,000 or less. Subparagraphs (a), (b), (d), and (e) of paragraph 1 are not applicable to this Contract if it was solicited pursuant to a finding of an emergency. Subparagraph (c) of paragraph 1 is neither applicable to this Contract if it was solicited prior to October 18, 2012 nor if it is a renewal of a contract executed prior to October 18, 2012.

NOTICE TO BIDDERS

Please be advised that the City of New York has revised the form of the performance bond that is required for City construction contracts that do not exceed \$5 million. The form of bond required for contracts that are greater than \$5 million has not changed. The City now has two approved forms. One form is to be used for contracts that do not exceed \$5 million and one form is to be used for contracts above \$5 million. The City's payment bond remains unchanged.

The new bond form for contracts that do not exceed \$5 million has been approved by the U.S. Small Business Administration ("SBA") for participation in their Bond Guarantee Program. The SBA's Bond Guarantee Program enables eligible small businesses to obtain or increase bonding by having the SBA act as a partial guarantor of the contractor to the surety. If you are interested in participating in this program, we suggest that you contact your broker or the SBA.

In order to maximize participation by small businesses in the SBA Guarantee Program, the City also encourages prime contractors who are awarded contracts greater than \$5 million to allow their subcontractors to use the SBA-approved form, particularly on contracts that are subject to Local Law 129 (the M/WBE program), if the prime contractor requires subcontractors to obtain performance bonds.

Notice to Bidders:

In 2013 the City will be implementing a new web based subcontractor reporting system. Once this subcontractor reporting system is implemented, and Contractor receives notice of its implementation, Contractor will be required to list in the system all of the subcontractors that it knows it will use or is already using in the performance of this contract. For each subcontractor listed, Contractor will be required to provide the following information: maximum contract value, description of subcontractor work, start and end date of the subcontract and identification of the subcontractor's industry. Identification of subcontractors in the system along with the required information will be required in order to obtain subcontractor approval under [section 3.02 of Appendix A][Article 17 of the Standard Construction Contract] and PPB Rule § 4-13 for all subcontractors that have not been approved as of the implementation date. Thereafter, Contractor will be required to report in the system the payments made to each subcontractor within 30 days of making the payment. If any of the required information changes throughout the term of the contract, Contractor will be required to revise the information in the system...

When the subcontractor reporting system is implemented, Contractor will receive a written notice from the City which will contain the information the Contractor will need to list its subcontractors and report payments. Contractor will not be required to comply with the requirements set forth herein until such notice is issued. Contractor will have 30 days from the date of the notice to list its current subcontractors for which it has already received Agency approval, if any. Thereafter, for those subcontractors that have not yet been approved by the Agency, subcontractors will have to be listed in the system in order to obtain the required Agency approval.

Failure of the Contractor to list a subcontractor and/or to report subcontractor payments in a timely fashion may result in the Agency declaring the Contractor in default of the Contract and may subject Contractor to liquidated damages in the amount of \$100 per day for each day that the Contractor fails to identify a subcontractor along with the required information about the subcontractor and/or fails to report payments to a subcontractor, beyond the time frames set forth herein or in the notice from the City. For construction contracts, the provisions of Article 15 of the Standard Construction Contract shall govern the issue of liquidated damages.

Contractor hereby agrees to these provisions and acknowledges that they will become effective on the date set forth in the notice.

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CITY OF NEW YORK
DEPARTMENT OF
DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

INFORMATION FOR BIDDERS

DELAY DAMAGES PILOT

September 2008

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INFORMATION FOR BIDDERS

1. Description and Location of Work

The description and location of the work for which bids are requested are specified in Attachment 1, "Bid Information". Attachment 1 is included in the Bid Booklet.

2. Time and Place for Receipt of Bids

Sealed bids shall be received on or before the date and hour specified in Attachment 1, at which time they will be publicly opened and read aloud in the presence of the Commissioner or his or her representative, and any bidders who may desire to be present.

3. Definitions

The definitions set forth in the Procurement Policy Board Rules shall apply to this Invitation For Bids.

4. Invitation For Bids and Contract Documents

(A) Except for titles, sub-titles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience) the following, except for such portions thereof as may be specifically excluded, shall be deemed to be part of the Contract and the Invitation for Bids.

- (1) All provisions required by law to be inserted in this Contract, whether actually inserted or not
- (2) The Contract Drawings and Specifications
- (3) The General Conditions, the General Requirements and the Special Conditions, if any
- (4) The Contract
- (5) The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and, if used, the Bid Booklet
- (6) The Budget Director's Certificate; all Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed with the Work.

(B) For particulars as to this procurement, including quantity and quality of the purchase, extent of the work or labor to be performed, delivery and performance schedule, and any other special instructions, prospective bidders are referred to the Invitation For Bids Documents. A copy of such documents can be obtained at the location set forth in Attachment 1.

(C) Deposit for Copy of Invitation For Bids Documents: Prospective bidders may obtain a copy of the Invitation For Bids Documents by complying with the conditions set forth in the Notice of Solicitation. The deposit must be in the form of a check or money order made payable to the City of New York, and drawn upon a state or national bank or trust company, or a check of such bank or trust company signed by a duly authorized officer thereof.

(D) Return of Invitation For Bids Documents: All Invitation For Bids Documents must be returned to the Department upon request. If the bidder elects not to submit a bid thereunder, the Invitation For Bids Documents shall be returned to the Department, along with a statement that no bid will be submitted.

(E) Return of Deposit: Such deposit will be returned within 30 days after the award of the contract or the rejection of all bids as set forth in the advertisement, provided the Invitation For Bids Documents are returned to the location specified in Attachment 1, in physical condition satisfactory to the Commissioner.

(F) Additional Copies: Additional copies of the Invitation For Bids Documents may be obtained, subject to the conditions set forth in the advertisement for bids.

5. Pre-Bid Conference

A pre-bid conference shall be held as set forth in Attachment 1. Nothing stated at the pre-bid conference shall change the terms or conditions of the Invitation For Bids Documents, unless a change is made by written amendment as provided in Section 9 below. Failure to attend a mandatory pre-bid conference shall constitute grounds for the rejection of the bid.

6. Agency Contact

Any questions or correspondence relating to this bid solicitation shall be addressed to the Agency Contact person specified in Attachment 1.

7. Bidder's Oath

(A) The bid shall be properly signed by an authorized representative of the bidder and the bid shall be verified by the written oath of the authorized representative who signed the bid, that the several matters stated and information furnished therein are in all aspects true.

(B) A materially false statement willfully or fraudulently made in connection with the bid or any of the forms completed and submitted with the bid may result in the termination of any Contract between the City and the Bidder. As a result, the Bidder may be barred from participating in future City contracts as well as be subject to possible criminal prosecution.

8. Examination and Viewing of Site, Consideration of Other Sources of Information and Changed Conditions

(A) Pre-Bidding (Investigation) Viewing of Site - Bidders must carefully view and examine the site of the proposed work, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions on, about or above the site relating to or affecting in any way the performance of the work to be done under the Contract which were or should have been indicated to a reasonably prudent bidder. To arrange a date for visiting the work site, bidders are to contact the Agency Contact person specified in Attachment 1.

(B) Should the contractor encounter during the progress of the work subsurface conditions at the site materially differing from any shown on the Contract Drawings or indicated in the Specifications or such subsurface conditions as could not reasonably have been anticipated by the contractor and were not anticipated by the City, which conditions will materially affect the cost of the work to be done under the Contract, the attention of the Commissioner must be called immediately to such conditions before they are disturbed. The Commissioner shall thereupon promptly investigate the conditions. If he finds that they do so materially differ, or that they could not reasonably have been anticipated by the contractor and were not anticipated by the City, the Contract may be modified with his written approval.

9. Examination of Proposed Contract

(A) Request for Interpretation or Correction: Prospective bidders must examine the Contract Documents carefully and before bidding must request the Commissioner in writing for an interpretation or correction of every patent ambiguity, inconsistency or error therein which should have been discovered by a reasonably prudent bidder. Such interpretation or correction, as well as any additional contract provisions the Commissioner may decide to include, will be issued in writing by the Commissioner as an addendum to the Contract, which will be transmitted to each person recorded as having received a copy of the Contract Documents from the Department. Transmission of such addendum will be by mail, e-mail, facsimile or hand delivery. Such addendum will also be posted at the place where the Contract Documents are available for the inspection of prospective bidders. Upon transmission as provided for herein, such addendum shall become a part of the Contract Documents, and binding on all bidders, whether or not actual notice of such addendum is shown.

(B) Only Commissioner's Interpretation or Correction Binding: Only the written interpretation or correction so given by the Commissioner shall be binding, and prospective bidders are warned that no other officer, agent or employee of the City is authorized to give information concerning, or to explain or interpret, the Contract.

(C) Documents given to a subcontractor for the purpose of soliciting the subcontractor's bid shall include either a copy of the bid cover sheet or a separate information sheet setting forth the project name, the Contract number (if available), the contracting agency and the Project's location.

10. Form of Bid

Each bid must be submitted upon the prescribed form and must contain: a) the name, residence and place of business of the person or persons making the same; b) the names of all persons interested therein, and if no other person is so interested, such fact must be distinctly stated; c) a statement to the effect that it is made without any connection with any other person making a bid for the same purpose and that it is in all respects fair and without collusion or fraud; d) a statement that no Council member or other officer or employee or person whose salary is payable in whole or part from the City Treasury is directly or indirectly interested therein or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof; e) a statement that the bidder is not in arrears to the City or to any agency upon a debt or contract or taxes, and is not a defaulter as surety or otherwise upon any obligation to the City to any agency thereof, except as set forth in the bid.

THE BID SHALL BE TYPEWRITTEN OR WRITTEN LEGIBLY IN INK. THE BID SHALL BE SIGNED IN INK. ERASURES OR ALTERATIONS SHALL BE INITIALED BY THE SIGNER IN INK. FAILURE TO CONFORM TO THE REQUIREMENTS OF THIS SECTION 10 SHALL RESULT IN THE REJECTION OF THE BID.

11. Irrevocability of Bid

The prices set forth in the bid cannot be revoked and shall be effective until the award of the Contract, unless the bid is withdrawn as provided for in Sections 15 and 18 below.

12. Acknowledgment of Amendments

The receipt of any amendment to the Contract Documents shall be acknowledged by the bidder in its bid submission.

13. Bid Samples and Descriptive Literature

Bid samples and descriptive literature shall not be submitted by the bidder, unless expressly requested elsewhere in the Contract or Contract Documents. Any unsolicited bid samples or descriptive literature which are submitted shall not be examined or tested and shall not be deemed to vary any of the provisions of this Contract.

14. Proprietary Information/Trade Secrets

(A) The bidder shall identify those portions of the bid which it deems to be confidential, proprietary information or trade secrets, and provide justification why such materials shall not be disclosed by the City. All such materials shall be clearly indicated by stamping the pages on which such information appears, at the top and bottom thereof with the word "Confidential". Such materials stamped "Confidential" must be easily separable from the non-confidential sections of the bid.

(B) All such materials so indicated shall be reviewed by the Agency and any decision not to honor a request for confidentiality shall be communicated in writing to the bidder. For those bids which are unsuccessful, all such confidential materials shall be returned to the bidder. Prices, makes and model or catalog numbers of the items offered, deliveries, and terms of payment shall be publicly available after bid opening, regardless of any designation of confidentiality made by the bidder.

15. Pre-Opening Modification or Withdrawal of Bids

Bids may be modified or withdrawn by written notice received in the office designated in Attachment 1, before the time and date set for the bid opening. If a bid is withdrawn in accordance with this Section, the bid security, if any, shall be returned to the bidder.

16. Bid Evaluation and Award

In accordance with the New York City Charter, the Procurement Policy Board Rules and the terms and conditions of this Invitation For Bids, this Contract shall be awarded, if at all, to the responsible bidder whose bid meets the requirements and evaluation criteria set forth in the Invitation For Bids, and whose bid price is either the most favorable bid price or, if the Invitation For Bids so states, the most favorable evaluated bid price. A bid may not be evaluated for any requirement or criterion that is not disclosed in the Invitation For Bids.

Restriction: No negotiations with any bidder shall be allowed to take place except under the circumstances and in the manner set forth in Section 21. Nothing in this Section shall be deemed to permit a contract award to a bidder submitting a higher quality item than that designated in the Invitation For Bids, if that bid is not also the most favorable bid.

17. Late Bids, Late Withdrawals and Late Modifications

Any bid received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. Any request for withdrawal or modification received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. The exception to this provision is that a late modification of a successful bid that makes the bid terms more favorable to the City shall be considered at any time it is received.

18. Withdrawal of Bids.

Except as provided for in Section 15, above, a bidder may not withdraw its bid before the expiration of forty-five (45) days after the date of the opening of bids; thereafter, a bidder may withdraw its bid only in writing and in advance of an actual award. If within sixty (60) days after the execution of the Contract, the Commissioner fails to fix the date for commencement of work by written notice to the bidder, the bidder, at his option, may ask to be relieved of his obligation to perform the work called for by written notice to the Commissioner. If such notice is given to the Commissioner, and the request to withdraw is granted, the bidder waives all claims in connection with this Contract.

19. Mistake in Bids

(A) Mistake Discovered Before Bid Opening: A bidder may correct mistakes discovered before the time and date set for bid opening by withdrawing or correcting the bid as provided in Section 15 above.

(B) Mistakes Discovered Before Award

(1) In accordance with General Municipal Law (Section 103, subdivision 11), where a unilateral error or mistake is discovered in a bid, such bid may be withdrawn upon written approval of the Agency Chief Contracting Officer if the following conditions are met:

- (a) The mistake is known or made known to the agency prior to the awarding of the Contract or within 3 days after the opening of the bid, whichever period is shorter; and
- (b) The price bid was based upon an error of such magnitude that enforcement would be unconscionable; and

- (c) The bid was submitted in good faith and the bidder submits credible evidence that the mistake was a clerical error as opposed to a judgment error; and
- (d) The error in the bid is actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of work, labor, material or services made directly in the compilation of the bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of the original work paper, documents, or materials used in the preparation of the bid sought to be withdrawn; and
- (e) It is possible to place the agency in the same position as existed prior to the bid.

(2) Unless otherwise required by law, the sole remedy for a bid mistake in accordance with this Article shall be withdrawal of the bid, and the return of the bid bond or other security, if any, to the bidder. Thereafter, the agency may, in its discretion, award the Contract to the next lowest bidder or rebid the Contract. Any amendment to or reformation of a bid or a Contract to rectify such an error or mistake therein is strictly prohibited.

(3) If the mistake and the intended correct bid are clearly evident on the face of the bid document, the bid shall be corrected to the intended correct bid and may not be withdrawn. Examples of mistakes that may be corrected are typographical errors, errors in extending unit prices, transposition errors and arithmetical errors.

20. Low Tie Bids

(A) When two or more low responsive bids from responsible bidders are identical in price, meeting all the requirements and criteria set forth in the Invitation For Bids, the Agency Chief Contracting Officer will break the tie in the following manner and order of priority:

- (1) Award to a certified New York City small, minority or woman-owned business entity bidder;
- (2) Award to a New York City bidder;
- (3) Award to a certified New York State small, minority or woman-owned business bidder;
- (4) Award to a New York State bidder.

(B) If two or more bidders still remain equally eligible after application of paragraph (A) above, award shall be made by a drawing by lot limited to those bidders. The bidders involved shall be invited to attend the drawing. A witness shall be present to verify the drawing and shall certify the results on the bid tabulation sheet.

21. Rejection of Bids

(A) Rejection of Individual Bids: The Agency may reject a bid if:

- (1) The bidder fails to furnish any of the information required pursuant to Section 24 or 28 hereof; or if
- (2) The bidder is determined to be not responsible pursuant to the Procurement Policy Board Rules; or if
- (3) The bid is determined to be non-responsive pursuant to the Procurement Policy Board Rules; or if
- (4) The bid, in the opinion of the Agency Chief Contracting Officer, contains unbalanced bid prices and is thus non-responsive, unless the bidder can show that the prices are not unbalanced for the probable required quantity of items, or if the imbalance is corrected pursuant to Section 15.

(B) Rejection of All Bids: The Agency, upon written approval by the Agency Chief Contracting Officer, may reject all bids and may elect to resolicit bids if in its sole opinion it shall deem it in the best interest of the City so to do.

(C) Rejection of All Bids and Negotiation With All Responsible Bidders: The Agency Head may determine that it is appropriate to cancel the Invitation For Bids after bid opening and before award and to complete the acquisition by negotiation. This determination shall be based on one of the following reasons:

- (1) All otherwise acceptable bids received are at unreasonable prices, or only one bid is received and the Agency Chief Contracting Officer cannot determine the reasonableness of the bid price, or no responsive bid has been received from a responsible bidder; or
- (2) In the judgment of the Agency Chief Contracting Officer, the bids were not independently arrived at in open competition, were collusive, or were submitted in bad faith.

(D) When the Agency has determined that the Invitation for Bids is to be canceled and that use of negotiation is appropriate to complete the acquisition, the contracting officer may negotiate and award the Contract without issuing a new solicitation, subject to the following conditions:

- (1) prior notice of the intention to negotiate and a reasonable opportunity to negotiate have been given by the contracting officer to each responsible bidder that submitted a bid in response to the Invitation for Bids;
- (2) the negotiated price is the lowest negotiated price offered by a responsible bidder; and
- (3) the negotiated price is lower than the lowest rejected bid price of a responsible bidder that submitted a bid in response to the Invitation for Bids.

22. Right to Appeal Determinations of Non-Responsiveness or Non-Responsibility and Right to Protest Solicitations and Award

The bidder has the right to appeal a determination of non-responsiveness or non-responsibility and has the right to protest a solicitation and award. For further information concerning these rights, the bidder is directed to the Procurement Policy Board Rules.

23. Affirmative Action and Equal Employment Opportunity

This Invitation For Bids is subject to applicable provisions of Federal, State and Local Laws and executive orders requiring affirmative action and equal employment opportunity.

24. VENDEX Questionnaires

(A) Requirement: Pursuant to Administrative Code Section 6-116.2 and the PPB Rules, bidders may be obligated to complete and submit VENDEX Questionnaires. Generally, if this bid is \$100,000 or more, or if this bid when added to the sum total of all contracts, concessions and franchises the bidder has received from the City and any subcontracts received from City contractors over the past twelve months, equals or exceeds \$100,000, Vendex Questionnaires must be completed. If required, Vendex Questionnaires must be completed and submitted before any award of contract may be made or before approval is given for a proposed subcontractor. Non-compliance with these submission requirements may result in the disqualification of the bid, disapproval of a subcontractor, subsequent withdrawal of approval for the use of an approved subcontractor, or the cancellation of the contract after its award.

(B) Submission: Vendex Questionnaires must be submitted directly to the Mayor's Office of Contract Services, ATTN: Vendex, 253 Broadway, 9th Floor, New York, New York 10007. In addition, the bidder must submit a Confirmation of Vendex Compliance to the agency. A form for this confirmation is set forth in the Bid Booklet.

(C) Obtaining Forms: Vendex Questionnaires, as well as detailed instructions, may be obtained at www.nyc.gov/vendex. The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.

25. Complaints About the Bid Process

The New York City Comptroller is charged with the audit of contracts in New York City. Any vendor who believes that there has been unfairness, favoritism or impropriety in the bid process should inform the Comptroller, Office of Contract Administration, One Centre Street, Room 835, New York, New York; telephone number (212)669-2797.

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in Attachment 1. The bid security shall assure the City of New York of the adherence of the bidder to its proposal, the execution of the Contract, and the furnishing of Performance and Payment Bonds by the bidder, if required in Attachment 1. Bid security shall be returned to the bidder as follows:

- (1) Within ten (10) days after the bid opening, the Comptroller will be notified to return the deposits of all but the three (3) lowest bidders. Within five (5) days after the award, the Comptroller will be notified to return the deposits of the remaining two unsuccessful bidders.
- (2) Within five (5) days after the execution of the Contract and acceptance of the Contractor's bonds, the Comptroller will be notified to return the bid security of the successful bidder or, if performance and payment bonds are not required, only after the sum retained under Article 21 of the Contract equals the amount of the bid security.
- (3) Where all bids are rejected, the Comptroller will be notified to return the deposit of the three (3) lowest bidders at the time of rejection.

(B) Performance and Payment Security: Performance and Payment Security must be provided in an amount and type specified in Attachment 1. The performance and payment security shall be delivered by the contractor prior to or at the time of execution of the Contract. If a contractor fails to deliver the required performance and payment security, its bid security shall be enforced, and an award of Contract may be made to the next lowest responsible and responsive bidder, or the contract may be rebid.

(C) Acceptable Types of Security: Acceptable types of security for bids, performance, and payment shall be limited to the following:

- (1) a one-time bond in a form satisfactory to the City;
- (2) a bank certified check or money order;
- (3) obligations of the City of New York; or
- (4) other financial instruments as determined by the Office of Construction in consultation with the Comptroller.

Whenever the successful bidder deposits obligations of the City of New York as performance and payment security, the Comptroller may sell and use the proceeds thereof for any purpose for which the principal or surety on such bond would be liable under the terms of the Contract. If the money is deposited with the Comptroller, the successful bidder shall not be entitled to receive interest on such money from the City.

(D) Form of Bonds: Security provided in the form of bonds must be prepared on the form of bonds authorized by the City of New York. Forms for bid, performance, and payment bonds are included in the Invitation for Bids Documents. Such bonds must have as surety thereunder such surety company or companies as are: (1) approved by the City of New York; (2) authorized to do business in the State of New York, and (3) approved by the Department of the Treasury of the United States. Premiums for any required bonds must be included in the base bid.

The bidder is advised that submission of a bid bond where the surety on such bond fails to meet the criteria set forth herein, shall result in the rejection of the bid as non-responsive.

The Department of the Treasury of the United States advises that information concerning approved surety companies may be obtained as follows: (1) from the Government Printing Office at 202-512-1800; (2) through the Internet at <http://www.fms.treas.gov/c570/index.html>, and (3) through a computerized public bulletin board, which can be accessed by using your computer modem and dialing 202-874-6887.

(E) Power of Attorney: Attorneys in fact who sign bid, performance, or payment bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

27. Failure to Execute Contract

In the event of failure of the successful bidder to execute the Contract and furnish the required security within ten (10) days after notice of the award of the Contract, the deposit of the successful bidder or so much thereof as shall be applicable to the amount of the award made shall be retained by the City, and the successful bidder shall be liable for and hereby agrees to pay on demand the difference between the price bid and the price for which such Contract shall be subsequently awarded, including the cost of any required reletting and less the amount of such deposit. No plea of mistake in such accepted bid shall be available to the bidder for the recovery of the deposit or as a defense to any action based upon such accepted bid. Further, should the bidder's failure to comply with this Section cause any funding agency, body or group (Federal, State, City, Public, Private, etc.) to terminate, cancel or reduce the funding on this project, the bidder in such event shall be liable also to the City for the amount of actual funding withdrawn by such agency on this project, less the amount of the forfeited deposit.

28. Bidder Responsibilities and Qualifications

(A) Bidders must include with their bids all information necessary for a determination of bidder responsibility, as set forth in the Specifications.

(B) The Agency may require any bidder or prospective bidder to furnish all books of account, records, vouchers, statements or other information concerning the bidder's financial status for examination as may be required by the Agency to ascertain the bidder's responsibility and capability to perform the Contract. If required, a bidder must also submit a sworn statement setting forth such information as the Agency may require concerning present and proposed plant and equipment, the personnel and qualifications of his working organizations, prior experience and performance record.

(C) Oral Examination on Qualifications: In addition thereto, and when directed by the Agency, the bidder, or a responsible officer, agent or employee of the bidder, must submit to an oral examination to be conducted by the Agency in relation to his proposed tentative plan and schedule of operations, and such other matters as the Agency may deem necessary in order to determine the bidder's ability and responsibility to perform the work in accordance with the Contract. Each person so examined must sign and verify a stenographic transcript of such examination noting thereon such corrections as such person may desire to make.

(D) If the bidder fails or refuses to supply any of the documents or information set forth in paragraph (B) hereof or fails to comply with any of the requirements thereof, the Agency may reject the bid.

29. Employment Report

In accordance with Executive Order No. 50 (1980) as modified by Executive Order 108 (1986), the filing of a completed Employment Report (ER) is a requirement of doing business with the City of New York for construction contractors with contracts of \$1,000,000 or more and subcontractors with construction subcontracts of \$750,000 or more. The required forms and information are included in the Bid Booklet.

30. Labor Law Requirements

(A) General: The successful bidder will be required to comply strictly with all Federal, State and local labor laws and regulations.

(B) New York State Labor Law: This Contract is subject to New York State Labor Law Section 220, which requires that construction workers on the site be paid prevailing wages and supplements. The Contractor is reminded that all wage provisions of this Contract will be enforced strictly and failure to comply will be considered when evaluating performance. Noncompliance may result in the contractor being debarred by the City from future contracts. Complaints filed with the Comptroller may result in decisions which may debar a contractor from bidding contracts with any state governmental entity and other political subdivisions.

(C) Records: The Contractor is expected to submit accurate payroll reports and other required documents and verify attendance and job classifications being utilized in compliance with the law, Contract provisions and agency procedures.

31. Insurance

(A) Bidders are advised that the insurance requirements contained herein are regarded as material terms of the Contract. As required by Article 22 of the Contract, the contractor must effect and maintain with companies licensed and authorized to do business in the State of New York, the types of insurance set forth therein, when required by and in the amounts set forth in Schedule A of the General Conditions. Such required insurance must be provided from the date the contractor is ordered to commence work and up to the date of final acceptance of all required work.

(B) The contractor must, within ten days of receipt of the notice of award, submit the following insurance documentation: (a) original certificate of insurance for general liability in the amount required by Schedule A of the General Conditions, and (b) original certificates of insurance or other proof of coverage for workers' compensation and disability benefits, as required by Section 57 of the New York State Workers' Compensation Law and Section 220 of the Disability Benefits Law.

32. Lump Sum Contracts

(A) Comparison of Bids: Bids on Lump Sum Contracts will be compared on the basis of the lump sum price bid, adjusted for alternate prices bid, if any.

(B) Lump Sum Bids for "General Construction Work" which include excavation shall include all necessary excavation work defined in the Specifications as being included in the lump sum bid. The bidder shall also bid a unit price for the additional cost of excavating material which is defined in the Specifications as excavation for which additional payment will be made. The total estimated additional cost of removing such material will be taken as the quantity set forth in the Engineer's Estimate multiplied by the unit price bid. This total estimated cost of additional excavation shall be added to the lump sum bid for the General Construction Work for the purpose of comparing bids to determine the low bidder.

(C) Variations from Engineer's Estimate: The Engineer's Estimate of the quantity of excavation for which additional payment will be made is approximate only and is given solely to be used as a uniform basis for the comparison of bids and such estimate is not to be considered as part of this contract. The quantities actually required to complete the contract work may be more or less than the quantities in the Engineer's Estimate and, if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

33. Unit Price Contracts

(A) Comparison of Bids: Bids on Unit Price Contracts will be compared on the basis of a total estimated price, arrived at by taking the sum of the estimated quantities of such items, in accordance with the Engineer's Estimate of Quantities set forth in the Bid Form, multiplied by the corresponding unit prices, and including any lump sum bids on individual items.

(B) Variations from Engineer's Estimate: Bidders are warned that the Engineer's Estimate of Quantities on the various items of work and materials is approximate only, given solely to be used as a uniform basis for the comparison of bids, and is not be considered part of this contract. The quantities actually required to complete the contract work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

(C) Overruns: The terms and conditions applicable to overruns of unit price items are set forth in Article 26 of the Contract.

34. Excise Tax

Bidders are referred to the Specifications for information on Federal Excise Tax exemptions.

35. Licenses and Permits

The successful bidder will be required to obtain all necessary licenses and permits necessary to perform the work.

36. Multiple Prime Contractors

If more than one prime contractor will be involved on this project, all contractors are required to examine the Invitation for Bid packages for all other parts of the project.

37. Locally Based Enterprise Requirements (LBE)

This Contract is subject to the requirements of Administrative Code, Section 6-108.1, and the regulations promulgated thereunder. No construction contract will be awarded unless and until these requirements have been complied with in their entirety. The bidder is advised of the provisions set forth below, as well as the provisions with respect to the Locally Based Enterprise Program contained in Article 67 of the Contract. The contractor is advised that:

(A) If any portion of the Contract is subcontracted, not less than ten percent of the total dollar amount of the contract shall be awarded to locally based enterprises ("LBEs"); except, where less than ten percent of the total dollar amount of the Contract is subcontracted, such lesser percentage shall be so awarded.

(B) No contractor shall require performance and payment bonds from LBE subcontractors.

(C) No Contract shall be awarded unless the contractor first identifies in its bid:

- (1) the percentage, dollar amount and type of work to be subcontracted; and
- (2) the percentage, dollar amount and type of work to be subcontracted to LBEs.

(D) Within ten calendar days after notification of low bid, the apparent low bidder shall submit an "LBE Participation Schedule" to the contracting agency. If such schedule does not identify sufficient LBE subcontractors to meet the requirements of Administrative Code Section 6-108.1, the apparent low bidder shall submit documentation of its good faith efforts to meet such requirements.

(1) The "LBE Participation Schedule" shall include:

- (a) the name and address of each LBE that will be given a subcontract,
- (b) the percentage, dollar amount and type of work to be subcontracted to the LBE, and
- (c) the dates when the LBE subcontract work will commence and end.

- (2) The following documents shall be attached to the "LBE Participation Schedule":
- (a) verification letters from each subcontractor listed in the "LBE Participation Schedule" stating that the LBE will enter into a formal agreement for work,
 - (b) certification documents of any proposed LBE subcontractor which is not on the LBE certified list, and
 - (c) copies of the certification letter of any proposed subcontractor which is an LBE.
- (3) Documentation of good faith efforts to achieve the required LBE percentage shall include as appropriate but not limited to the following:
- (a) attendance at prebid meetings, when scheduled by the agency, to advise bidders of contract requirements;
 - (b) advertisement where appropriate in general circulation media, trade association publications and small business media of the specific subcontracts that would be at least equal to the percentage goal for LBE utilization specified by the contractor;
 - (c) written notification to association of small, minority and women contractors soliciting specific subcontractors;
 - (d) written notification by certified mail to LBE firms that their interest in the contract is solicited for specific work items and their estimated values;
 - (e) demonstration of efforts made to select portions of the work for performance by LBE firms in order to increase the likelihood of achieving the stated goal;
 - (f) documented efforts to negotiate with LBE firms for specific subcontracts, including at a minimum:
 - (i) The names, address and telephone numbers of LBE firms that are contacted;
 - (ii) A description of the information provided to LBE firms regarding the plans and specifications for portions of the work to be performed;
 - (iii) Documentation showing that no reasonable price can be obtained from LBE firms;
 - (iv) A statement of why agreements with LBE firms were not reached;
 - (g) a statement of the reason for rejecting any LBE firm which the contractor deemed to be unqualified; and
 - (h) documentation of efforts made to assist the LBE firms contacted that needed assistance in obtaining required insurance.

(E) Unless otherwise waived by the Commissioner with the approval of the Office of Economic and Financial Opportunity, failure of a proposed contractor to provide the information required by paragraphs (C) and (D) above may render the bid non-responsive and the Contract may not be awarded to the bidder. If the contractor states that it will subcontract a specific portion of the work, but can demonstrate despite good faith efforts it cannot achieve its required LBE percentage for subcontracted work until after award of Contract, the Contract may be awarded, subject to a letter of compliance from the contractor stating that it will comply with Administrative Code Section 6-108.1 and subject to approval by the Commissioner. If the contractor has not met its required LBE percentage prior to award, the contractor shall demonstrate that a good faith effort has been made subsequent to award to obtain LBEs on each subcontract until it meets the required percentage.

(F) When a bidder indicates prior to award that no work will be subcontracted, no work may be subcontracted without the prior written approval of the Commissioner, which shall be granted only if the contractor in good faith seeks LBE subcontractors at least six weeks prior to the start of work.

(G) The contractor may not substitute or change any LBE which was identified prior to award of the contract without the written permission of the Commissioner. The contractor shall make a written application to the Commissioner for permission to make such substitution or change, explaining why the contractor needs to change its LBE subcontractor and how the contractor will meet its LBE subcontracting requirement. Copies of such application must be served on the originally identified LBE by certified mail return receipt requested, as well as the proposed substitute LBE. The Commissioner shall determine whether or not to grant the contractor's request for substitution.

38. Bid Submission Requirements

The Bid Submission Requirements are set forth on page 2 of the Bid Booklet.

39. Comptroller's Certificate

This Contract shall not be binding or of any force unless it is registered by the Comptroller in accordance with Section 328 of the City Charter and the Procurement Policy Board Rules. This Contract shall continue in force only after annual appropriation of funds by the City of New York and certification as hereinabove set forth.

40. Procurement Policy Board Rules

This Invitation For Bids is subject to the Rules of the Procurement Policy Board of the City of New York. In the event of a conflict between said Rules and a provision of this Invitation For Bids, the Rules shall take precedence.

41. DDC Safety Requirements

The DDC Safety Requirements apply to the work to be performed pursuant to the Contract. The DDC Safety Requirements are set forth on the following pages.

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
SAFETY REQUIREMENTS

THE DDC SAFETY REQUIREMENTS INCLUDE THE FOLLOWING SECTIONS:

- I. POLICY ON SITE SAFETY**
- II. PURPOSE**
- III. DEFINITIONS**
- IV. RESPONSIBILITIES**
- V. SAFETY QUESTIONNAIRE**
- VI. SAFETY PROGRAM AND SITE SAFETY PLAN**
- VII. KICK-OFF/PRE-CONSTRUCTION MEETINGS AND SAFETY REVIEW**
- VIII. EVALUATION DURING WORK IN PROGRESS**
- IX. SAFETY PERFORMANCE EVALUATION**

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I. POLICY ON SITE SAFETY

The City of New York Department of Design and Construction (DDC) is committed to a policy of injury and illness prevention and risk management for construction work that will ensure the safety and health of the workers engaged in the projects and the protection of the general public. Therefore, it is DDC's policy that work carried out by Contractors on DDC jobsites must, at a minimum, comply with applicable federal, state and city laws, rules and regulations, including without limitation:

- ☐ U. S. Department of Labor 29 Code of Federal Regulations (CFR) Part 1926 and applicable Sub-parts of Part 1910 – U.S. Occupational Safety and Health Administration (OSHA) including, but not limited to "Respiratory Protection" (29 CFR 1910.134), "Permit-Required Confined Spaces" (29 CFR 1910.146), and "Hazard Communication" (29 CFR 1910.1200);
- ☐ New York State Department of Labor Industrial Code Rule 23 – Protection in Construction, Demolition and Excavation;
- ☐ New York City Construction Codes, Title 28
- ☐ NYC Department of Transportation Title 34 Chapter 2 – Highway Rules
- ☐ New York State Department of Labor Industrial Code Rule 753
- ☐ NYC Local Law No. 113 (2005) Noise Control Code

In addition, all regulations promulgated by the NYC Department of Transportation, including requirements for Maintenance and Protection of Traffic (MPT), are applicable when contained in contract specifications. While MPT is a significant component of work in our Infrastructure Division, it does not supersede or exempt Contractors from complying with other applicable health and safety standards (for example, excavating and trenching standards, operation of heavy equipment and compliance with City environmental and noise regulations).

I. PURPOSE

The purpose of this policy is to ensure that Contractors perform their work and supervise their employees in accordance with all applicable federal, state and city rules and regulations. Further, Contractors will be expected to minimize or eliminate jobsite and public hazard, through a planning, inspection, auditing and corrective action process. The goal is to control risks so that injuries, illnesses and accidents to contractors' employees, DDC employees and the general public, as well as damage to city-owned and private property, are reduced to the lowest level feasible.

III. DEFINITIONS

Agency Chief Contracting Officer (ACCO): The ACCO shall mean the person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the CCPO.

Competent Person: As defined by OSHA, an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees or the general public, and who has authorization to take prompt corrective measures to eliminate them.

Construction Safety Auditor: A representative of the QACS Construction Safety Unit who provides inspection and assessment services to enhance health and safety on all DDC construction projects. The activities of the Construction Safety Auditor include performing site surveys, reviewing health and safety plans, reviewing construction permits, and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

Construction Safety Unit: A part of QACS within the Division of Technical Support that assesses contractor safety on DDC jobsites and advises responsible parties of needed corrective actions.

Construction Superintendent: A representative of the contractor responsible for overseeing performance of the required construction work. This individual must engage in sound construction practices, and is responsible to maintain a safe work site. In the case of a project involving the demolition, alteration or new construction of buildings, the Construction Superintendent must be licensed by the NYC Department of Buildings.

Contractor: For purposes of these Safety Requirements, the term "Contractor" shall mean any person or entity that enters into a contract for the performance of construction work on a DDC project. The term "Contractor" shall include any person or entity which enters into any of the following types of contracts: (1) a prime construction contract for a specific project, (2) a prime construction contract using the Job Order Contracting System ("JOCS Contract"), and (3) a subcontract with a CM/Builder ("First Tier Subcontract").

Director - Quality Assurance and Construction Safety (QACS): Responsible for the operations of the QACS Construction Safety Unit and the DDC Site Safety management programs.

Job Hazard Assessment (JHA): A process of identifying site-specific hazards that may be present during construction and establishing the means and methods to reduce or eliminate those hazards.

Jobsite Safety Coordinator: A person designated by the Contractor to be onsite during all activities. This individual shall have received, at a minimum, the OSHA 10-hour construction safety program. Other examples of acceptable training are the 30-hour OSHA Safety and Health Standards for the Construction Industry training program (OSHA 510) or a degree/certificate in a safety and health from a college-level curriculum. This person does not necessarily have to be dedicated full-time to site safety, but must have sufficient experience and authority to undertake corrective action and must qualify to be a competent person. For certain projects, as defined in NYC Construction Codes – Title 28, this person may be required to have a Site Safety Manager's License issued by the NYC DOB.

Qualified Person: As defined by OSHA, an individual who, by possession of a recognized degree, certificate, license or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve problems relating to the subject matter, the work, or the project. Qualified Persons are required under regulation to address issues pertaining, but without limit, to fall protection, scaffold design and trenching and shoring, among others.

Resident Engineer (RE) / Construction Project Manager (CPM): Representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the work. (The RE/CPM may be a third-party consultant, including a CM, retained by DDC.)

Safety Program: Established by the Contractor that covers all operations of that Contractor and establishes the Contractor's overall safety policy, regulatory compliance plan and minimum safety standards. The Safety Program must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

Safety Questionnaire: Used by DDC to evaluate Contractor's current and past safety performance. It is required to be completed by all Contractors initially when submitting bids for Construction work, or when being pre-qualified and updated annually or as requested by the DDC.

Site Safety Plan: A site-specific safety plan developed by the Contractor for a specific project. The Site Safety Plan must identify hazards associated with the project, and include specific safety precautions and training appropriate and necessary to complete the work. The Site Safety Plan must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

Unsafe or Unhealthy Condition: A condition that could be potentially hazardous to the health and safety of personnel or the public, and/or damaging to equipment, machinery, property or the environment.

Weekly Safety Meetings: Weekly documented jobsite safety meetings, given to all jobsite personnel by contractor, with the purpose of discussing general safety topics and job specific requirements encountered at the DDC work site.

IV. RESPONSIBILITIES

All persons who manage, perform, and provide support for construction projects shall conduct operations in compliance with the requirements identified in this Policy and all applicable governing regulatory agency requirements and guidelines pertaining to safety in construction.

A. Resident Engineer / Construction Project Manager / Construction Manager

- Monitors the issuance of safety-related permits, approvals and drawings and maintains copies on site.
- Monitors construction-related work activities to confirm that they are conducted in accordance with DDC policies and all applicable regulations that pertain to construction safety.
- Maintains documentation and periodically attends weekly safety meeting.
- Notifies the Construction Safety Unit and the ACCO's Insurance and Risk Management Unit of project-related accidents and emergencies, as per DDC's Construction Safety Emergency Protocol.
- Gathers facts related to all accidents and prepares DDC Accident Reports.
- Notifies the Construction Safety Unit of outside regulatory agency inspections and forwards a copy of the inspection report within three days of its receipt.
- Monitors the conditions at the site for conformance with the Site Safety Plan and DDC construction documents.
- Notifies the contractor and DDC in the event that any condition or activity exists that is not in compliance with the Site Safety Plan, applicable federal, state or local codes or any condition that presents a potential risk of injury to the public or workers or possible damage to property.
- Notifies DDC of any emergency condition and directs the contractor to provide such labor, materials, equipment and supervision to abate such conditions.
- Reports gross safety violations to the Construction Safety Unit immediately.

A. Contractors

- Complete a Safety Questionnaire and submit with its bid or as part of a pre-qualification package.
- Provide a Written Job Hazard Assessment (JHA) that identifies expected safety issues of the work to be performed. JHA shall be included with the Site Safety Plan submitted by the contractor.
- Submit a Site Safety Plan and Safety Program within 15 days of issuance of the Notice to Proceed, or as otherwise directed. The Site Safety Plan and Safety Program are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. The Site Safety Plan shall be revised and updated as necessary.
- Ensure that all employees are aware of the hazards associated with the project through formal and informal training and/or other communications. Conduct and document weekly safety meetings for the duration of the project. Documentation to be provided to the RE/CPM/CM on a monthly basis.
- Name a Construction Superintendent, if required.
- Name a Job Site Safety Coordinator. The Contractor will be required to identify the Job Site Safety Coordinator in the Site Safety Plan.
- Comply with all mandated federal, state and local safety and health rules and regulations.
- Comply with all provisions of the Site Safety Plan.
- As part of the Site Safety Plan, prepare a site specific MPT (if not otherwise provided in the contract documents) and comply with all of its provisions.
- Conduct and document site-specific safety orientation for Contractor personnel to review the hazards associated with the project as identified in the Site Safety Plan and the specific safety procedures and controls that will be used to protect workers, the general public and property. The Job Site Safety Coordinator will conduct this training prior to mobilization and provide documentation to the RE/CPM/CM.
- Provide, replace and adequately maintain at or around the project site, suitable and sufficient signage, lights, barricades and enclosures (fences, sidewalk sheds, netting, bracing, etc.).
- Report unsafe conditions or hazards to the DDC RE/CPM/CM as soon as practical, but no more than 24 hours after discovery, and take action to remove or abate such conditions.

- Report any accident involving injuries to workers or the general public, as well as property damage, to the DDC RE/CPM/CM within two (2) hours.
- Notify the DDC RE/CPM/CM within two (2) hours of the start of an inspection by any regulatory agency personnel, including OSHA.
- Maintain all records pertaining to all required compliance documents and accident and injury reports.
- Respond to DDC recommendations on safety, which shall in no way relieve the Contractor of its responsibilities for safety on the project. The Contractor has sole responsibility for safety.

V. SAFETY QUESTIONNAIRE

DDC requires that all Contractors provide information regarding their current and past safety and environmental performance and programs. This will be accomplished by the use of the DDC Safety Questionnaire. As a part of the bid submittal package, the contractor must submit a completed DDC Safety Questionnaire listing their workers' compensation experience modification rating and OSHA Incidence Rates for the three (3) years prior to the date of the bid opening. DDC may request a Contractor to update its Questionnaire at any time or to provide more detailed information. The Contractor must provide the requested update within 30 days.

The following criteria will be used by DDC in reviewing the Contractor's responsibility, which will be based on the information provided on the questionnaire:

- Criteria 1: OSHA Injury and Illness Rates (I&IR) are no greater than the average for the industry (based on the most current Bureau of Labor Statistics data for the Contractors SIC code); and
- Criteria 2: Insurance workers compensation Experience Modification Rate (EMR) equal to or less than 1.0; and
- Criteria 3: Any willful violations issued by OSHA or NYC DOB within the last three years; and
- Criteria 4: A fatality (worker or member of public) experienced on or near Contractor's worksite within the last three (3) years; and
- Criteria 5: An unacceptable rating by QACS based on past performance on DDC projects; and
- Criteria 6: Contractor has in place an acceptable corporate safety program and its employees shall have completed all documented relative safety training; and
- Criteria 7: Contractor shall provide OSHA Injury Records (currently OSHA 300 Log) for the last three (3) years.

If the Contractor fails to meet the basic criteria listed above, the Construction Safety Unit may request, through the ACCO, more detail concerning the Contractor's safety experience. DDC may request the Contractor to provide copies of, among other things, OSHA records, OSHA and DOB citations, EPA citations and written Safety Programs.

VI. SAFETY PROGRAM AND SITE SAFETY PLAN

Within fifteen (15) days of issuance of the Notice to Proceed, or as otherwise directed, the Contractor shall submit the following: (1) Safety Program, and (2) Site Safety Plan. The Safety Program shall set forth the Contractor's overall safety policy, regulatory compliance plan and minimum safety standard, and the Site Safety Plan shall identify hazards associated with the project, and include specific safety precautions and training appropriate and necessary to complete the work. The Safety Program and the Site Safety Plan are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. Failure by the contractor to submit an acceptable Site Safety Plan and Safety Program shall be grounds for default.

The Site Safety Plan shall apply to all Contractor and subcontractor operations, and shall have at a minimum, the following elements. Each element shall be described in a separate section in the written document. It may be necessary to modify the basic format for certain unique or high-risk projects (such as tunnels or high-rise construction). The basic elements are as follows:

1. **Responsibility and Organization:** Identify the person or persons with authority and responsibility for implementing the Site Safety Plan. Provide an organization chart and define levels of authority and responsibility. Identify the Competent Person, the Construction Superintendent (if required), the Job Safety Coordinator and the Qualified Person required for this project.
2. **Communication:** Establish a system for communicating with employees and subcontractors on matters relating to worker and public safety and health and environmental protection, including provisions designed to encourage employees to inform the employer of hazards at the worksite without fear of reprisal. An emergency response notification protocol is to be established that also includes after hours contact numbers. The plan must also include provisions for weekly safety meetings held by the Job Site Safety Coordinator.
3. **Job Hazard Assessment:** A written document submitted by the contractor, used to identify expected job hazards and public safety risks and state the specific means and methods to reduce, control or eliminate those hazards. This part of the Site Safety Plan must also include how on-going evaluations of those risks and hazards will be carried out, including plans for periodic inspections to identify unsafe conditions, work practices and public safety hazards.
4. **Accident/Exposure Investigation:** Establish a procedure to investigate and report occupational and public injury or illness, property damage, vehicle accidents or other mishaps.
5. **Hazard Correction:** Establish means, methods and/or procedures for correcting unsafe or unhealthy conditions that might be exposing both the public and workers to hazards. Corrective actions must be taken immediately when observed or discovered. Should an imminent hazard exist which cannot be immediately abated without endangering employees, the public and/or property, remove or restrict all exposed persons from the area except those necessary to correct the existing condition. Employees necessary to correct the hazardous condition shall be provided the necessary safeguards. When corrective actions cannot be taken immediately, temporary measures should be taken until such time permanent measures are taken to eliminate the potential risks or hazards.
6. **Training:** Describe site-specific hazard training programs. In addition to the required safety orientation, additional site specific training, in the form of required weekly safety meetings, will be required. Contractors must also initiate training when: a) new employees are hired; b) employees are given new job assignments for which training has not been previously received; c) new substances, processes, procedures or equipment are introduced that might represent a new public or worker hazard; d) the employee is made aware of a new or previously unrecognized hazard; e) new supervisors are assigned to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed; and f) after a jobsite incident or accident has occurred.
7. **Recordkeeping:** Establish procedures to maintain records of scheduled and periodic inspections, weekly safety meetings, and training records. Updated records shall be maintained at the jobsite, accessible to the Construction Safety Auditors and/or Quality Assurance Auditors/RE/CPM, and retained in accordance with DDC policy.

The most critical component of the Site Safety Plan is the Job Hazard Assessment section. This section must address specific hazards that are anticipated throughout the project. Each Site Safety Plan must address, at a minimum:

- Public and pedestrian safety
- Fall protection
- Electrical hazards
- Scaffolding
- Fire protection
- Emergency notification & response
- Housekeeping / debris removal
- Dust control
- Maintenance and protection of traffic
- Trenching and excavating
- Heavy equipment operations
- Material / equipment storage
- Environmental contamination
- Sheeting and shoring
- Alcohol and Drug Abuse Policy

The following additional hazards must be addressed, if applicable, based on the contract safety specifications and/or the results of the JHA (the list is not all-inclusive):

- Basic Personal Protective Equipment
- Compressed Air
- Compressed Gas Cylinders
- Cranes, Derricks and Hoists
- Demolition
- Electrical safety
- Excavations and Trenching
- Fall Protection – Floor openings/Stairways
- Fall Protection – Guardrails Toe boards etc
- Fall Protection – Leading Edge
- Fall Protection – Personal Fall Protection Devices
- Fire Protection and Fire Prevention
- Hazard Communication (RIGHT TO KNOW)
- Hazardous Energy & Lock Out / Tag Out
- Housekeeping/ Sanitation
- Maintenance and Protection of Traffic (MPT)
- Man Lifts /Aerial Lifts
- Marine Operations
- Motor Vehicle Safety
- Overhead Power lines
- Permit Required Confined Space
- Portable Ladders
- Powered Actuated Tools
- Powered Material Handling Equipment
- Scaffolds – Mobile
- Scaffolds – Stationary
- Scaffolds – Suspended
- Slings
- Steel Erection
- Welding and Cutting (Hot Work)
- Airborne Contaminants – Particulates – General
- Asbestos
- Blood borne Pathogens
- Hearing Protection
- Lead in Construction
- Mercury in Construction
- PCB's
- Respiratory Protection
- Silica
- Thermal Stress
- West Nile Virus
- Rodents and Vermin
- Noise Mitigation Plan

Certain DDC programs, such as Job Order Contracting System (JOCS), may not necessarily require Site Safety Plans. The JOCS contractor will be required to submit a Safety Program. In addition, certain DDC Operating Units may establish program or client-specific safety requirements. The contractor's Site Safety Plan must address such program or client specific safety requirements.

VII. KICK-OFF MEETINGS/PRE-CONSTRUCTION AND SAFETY REVIEW

As part of the construction kick-off meeting, a Site Safety Plan review will be part of the agenda. A QACS representative will participate in this meeting with the contractor prior to the start of the project for the purpose of:

- A. Reviewing the safety issues detailed in the contract.
- B. Reviewing the Site Safety Plan.
- C. Reviewing any new issues or information that was not previously addressed.
- D. Discussing planned inspections and audits of the site by DDC personnel.

VIII. EVALUATION DURING WORK IN PROGRESS

The Contractor's adherence to these Safety Requirements will be monitored throughout the project. This will be accomplished by the following:

- A. Use of a safety checklist by a representative of the Construction Safety Unit or other designated DDC representative or Consultant during regular, unannounced inspections of the job site. Field Exit Conferences will be held with the RE/CPM, Contractor Superintendents or Safety Representatives.
- B. The RE/CPM will continually monitor the safety and environmental performance of the contractor's employees and work methods. Deficiencies shall be brought to the attention of the contractor's representative on site for immediate correction. The DDC representative will maintain a written record of these deficiencies and forward them to the Construction Safety Unit on a weekly basis. Any critical deficiencies shall be immediately reported to QACS phone# (718) 391-1624 or (718) 391-1911.
- C. If the Contractor's safety performance during the project is not up to DDC standards (safety performance measure, accident/incident rate, etc.) the Director- QACS, or designee will meet with the Contractor's safety representative, the DDC project manager, the RE/CPM, or the DDC Environmental Specialist (if environmental issues are involved). The purpose of this meeting is to 1) determine the level of non-compliance; 2) explain and clarify the safety/environmental provisions; 3) agree on a future course of action to correct the deficiencies.
- D. If the deficiencies continue to occur with inadequate attention by the contractor, this shall, among other remedies available, be grounds for default.
- E. The contractor shall inform the Construction Safety Unit and ACCO Insurance and Risk Management Unit of all medical injuries or illnesses that require doctors' treatment resulting from an on-the-job incident within 24 hours of the occurrence. The Construction Safety Unit shall also be immediately informed of all fatalities, catastrophic accidents with more than one employee hospitalized, any injuries to members of the general public and major equipment damage (e.g., property damage, equipment rollovers, loads dropped from crane). QACS shall maintain a record of all contractor injuries and illnesses during the project and provide regular reports to the Agency.
- F. The Construction Safety Unit shall be immediately notified at the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections. The Director of Quality Assurance & Construction Safety shall maintain a log of all contractor OSHA/EPA inspections and citations during the project.

IX. SAFETY PERFORMANCE EVALUATION

The contractor's safety record, including all DDC inspection results, will be considered as part of the Contractor's performance evaluation at the conclusion of the project. Poor safety performance during the course of the project shall be a reason to rate a Contractor unsatisfactory which will be reflected in the City's Vendex system and will be considered for future procurement actions as set forth in the City's Procurement Policy Board Rules.

the enclosed label is to be used in the event of a fire or other emergency. It should be placed in a conspicuous place, such as near the entrance to the building, and should be kept up-to-date.

It is the policy of the Department to maintain a high standard of fire safety.

The following information is for your information only. It is not to be used for any other purpose.

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CITY OF NEW YORK
STANDARD CONSTRUCTION CONTRACT
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September 2008

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STANDARD CONSTRUCTION CONTRACT**

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CITY OF NEW YORK

STANDARD CONSTRUCTION CONTRACT (September 2008)

The Standard Construction Contract dated September 2008 (the "Contract") is amended as set forth below.

- Article 77: Article 77, Part A, Section 5 is deleted in its entirety and replaced with the following:
 5. Where a Subcontractor Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multi-year contracts, such list shall also be submitted every year thereafter. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5), [i.e., a contract valued at or below \$3M (for projects in New York City) or a contract that is subject to a Project Labor Agreement] where the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades [i.e., plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring], the Contractor must identify all those to which it intends to award construction subcontracts for any of the Wicks trades, regardless of what point in the life of the contract such subcontracts will occur, at the time of bid submission. In the event that the Contractor's selection of a subcontractor is disapproved, the Contractor shall have a reasonable time to propose alternate subcontractors.**
- Article 77: Article 77, Part A, Section 11 is deleted in its entirety and replaced with the following:
 11. **Modification of Subcontractor Utilization Plan.** A Contractor may request a modification of its Subcontractor Utilization Plan (Subcontractor Participation Goals) after award of this Contract. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5), [i.e., a contract valued at or below \$3M (for projects in New York City) or a contract that is subject to a Project Labor Agreement] where the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades [i.e., plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring], the Contractor may request a Modification of its Subcontractor Utilization Plan as part of its bid submission. The Agency may grant a request for Modification of a Contractor's Subcontractor Utilization Plan if it determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts to meet the Subcontractor Participation Goals. In making such determination, Agency shall consider evidence of the following efforts, as applicable, along with any other relevant factors:**

Sub-paragraphs (a) through (h) remain unchanged.

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WITNESSETH:

The parties in consideration of the mutual agreements contained herein, agree as follows:

**CHAPTER I
THE CONTRACT AND DEFINITIONS**

ARTICLE 1. THE CONTRACT

1.1 Except for titles, subtitles, headings, running headlines, tables of content and indices (all of which are printed herein merely for convenience), the following, except for such portions thereof as may be specifically excluded, shall be deemed to be part of this Contract:

1.1.1 All provisions required by law to be inserted in this Contract, whether actually inserted or not;

1.1.2 The Contract Drawings and Specifications;

1.1.3 The General Conditions and Special Conditions, if any;

1.1.4 The Contract;

1.1.5 The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and, if used, the Bid Booklet;

1.1.6 The Budget Director's Certificate; all Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed with the Work.

1.2 Should any conflict occur in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated the most expensive way of doing the Work, unless the Contractor shall have asked for and obtained a decision in writing from the Commissioner, of the Agency that is entering into this Contract, before the submission of its bid as to what shall govern.

ARTICLE 2. DEFINITIONS

2.1 The following words and expressions, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless a different meaning is clear from the context:

2.1.1 "Addendum" or "Addenda" shall mean the additional Contract provisions issued in writing by the Commissioner prior to the receipt of bids.

2.1.2 "Agency" shall mean a city, county, borough or other office, position, department, division, bureau, board or commission, or a corporation, institution or agency of government, the expenses of which are paid in whole or in part from the City treasury.

2.1.3 "Agency Chief Contracting Officer" (ACCO) shall mean a person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the CCPO.

2.1.4 "City" shall mean the City of New York.

2.1.5 **"City Chief Procurement Officer" (CCPO)** shall mean a person delegated authority by the Mayor to coordinate and oversee the procurement activity of Mayoral agency staff, including the ACCO and any offices which have oversight responsibility for the procurement of construction.

2.1.6 **"Commissioner"** shall mean the head of the Agency that has entered into this Contract, or his/her duly authorized representative.

2.1.7 **"Comptroller"** shall mean the Comptroller of the City of New York.

2.1.8 **"Contract" or "Contract Documents"** shall mean each of the various parts of the contract referred to in Article 1 hereof, both as a whole and severally.

2.1.9 **"Contract Drawings"** shall mean only those drawings specifically entitled as such and listed in the Specifications or in any Addendum, or any drawings furnished by the Commissioner, pertaining or supplemental thereto.

2.1.10 **"Contract Work"** shall mean everything required to be furnished and done by the Contractor by any one or more of the parts of the Contract referred to in Article 1, except Extra Work as hereinafter defined.

2.1.11 **"Contractor"** shall mean the entity which executed this Contract, whether a corporation, firm, partnership, joint venture, individual, or any combination thereof, and it(s), their, his/ her successors, personal representatives, executors, administrators and assigns, and any person, firm, partnership, joint venture, individual, or corporation which shall at any time be substituted in the place of the Contractor under this Contract.

2.1.12 **"Days"** shall mean calendar days, except where otherwise specified.

2.1.13 **"Engineer" or "Architect" or "Project Manager"** shall mean the person so designated in writing by the Commissioner to act as such in relation to this Contract, including a private Architect or Engineer or Project Manager, as the case may be.

2.1.14 **"Engineering Audit Officer" (EAO)** shall mean the person so designated by the Commissioner to perform responsible auditing functions hereunder.

2.1.15 **"Extra Work"** shall mean Work other than that required by the Contract at the time of award which is authorized by the Commissioner pursuant to Chapter VI of this Contract.

2.1.16 **"Federal-Aid Contract"** shall mean a contract in which the United States (federal) Government provides financial funding as so designated in the Information for Bidders.

2.1.17 **"Final Acceptance"** shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

2.1.18 **"Final Approved Punch List"** shall mean a list, approved in writing by the Engineer, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.

2.1.19 **"Law" or "Laws"** shall mean the Constitution of the State of New York, the New York City Charter, the New York City Administrative Code, a Statute of the United States or

of the State of New York, a local law of the City of New York, any ordinance, rule or regulation having the force of law, or common law.

2.1.20 **"Materialman"** shall mean any corporation, firm, partnership, joint venture, or individual, other than employees of the Contractor, who or which contracts with the Contractor or any Subcontractor, to fabricate or deliver, or who actually fabricates or delivers, plant, materials or equipment to be incorporated in the Work.

2.1.21 **"Means and Methods of Construction"** shall mean the labor, materials, temporary structures, tools, plant, and construction equipment, and the manner and time of their use, necessary to accomplish the result intended by this Contract.

2.1.22 **"Other Contractor(s)"** shall mean any Contractor (other than the entity which executed this Contract or its Subcontractors) who has a contract with the City for work on or adjacent to the building or site of the Work.

2.1.23 **"Payroll Taxes"** shall mean State Unemployment Insurance ("SUI"), Federal Unemployment Insurance (FUI) and payments pursuant to the Federal Insurance Contributions Act ("FICA").

2.1.24 **"Project"** shall mean the public improvement to which this Contract relates.

2.1.25 **"Procurement Policy Board" (PPB)** shall mean the Agency of the City of New York whose function is to establish comprehensive and consistent procurement policies and rules which shall have broad application throughout the City.

2.1.26 **"Required Quantity"** in a unit price Contract shall mean the actual quantity of any item of Work or materials which is required to be performed or furnished in order to comply with the Contract.

2.1.27 **"Resident Engineer"** shall mean the representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the Work.

2.1.28 **"Site"** shall mean the area upon or in which the Contractor's operations are carried on, and such other areas adjacent thereto as may be designated as such by the Engineer.

2.1.29 **"Specifications"** shall mean all of the directions, requirements and standards of performance applying to the Work as hereinafter detailed and designated under the Specifications.

2.1.30 **"Subcontractor"** shall mean any person, firm or corporation, other than employees of the Contractor, who or which contracts with the Contractor or with its Subcontractors to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, at the site. Wherever the word Subcontractor appears, it shall also mean Sub-Subcontractor.

2.1.31 **"Substantial Completion"** shall mean the written determination by the Commissioner that the Work required under this Contract is substantially, but not entirely, complete.

2.1.32 **"Treasurer"** shall mean the Commissioner of the Department of Finance of the City of New York.

2.1.33 "Work" shall mean all services required to complete the Project in accordance with the Contract Documents, including without limitation, labor, material, superintendence, management, administration, equipment, and incidentals, and shall include both Contract Work and Extra Work.

CHAPTER II THE WORK AND ITS PERFORMANCE

ARTICLE 3. CHARACTER OF THE WORK

3.1 Unless otherwise expressly provided in the Contract Drawings, Specifications and Addenda, the Work shall be performed in accordance with the best modern practice, utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship and design of the highest quality, to the satisfaction of the Commissioner.

ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION

4.1 Unless otherwise expressly provided in the Contract Drawings, Specifications and Addenda, the Means and Methods of Construction shall be such as the Contractor may choose; subject, however, to the Engineer's right to reject the Means and Methods of Construction proposed by the Contractor which in the opinion of the Engineer:

- 4.1.1 Will constitute or create a hazard to the Work, or to persons or property; or
- 4.1.2 Will not produce finished Work in accordance with the terms of the Contract; or
- 4.1.3 Will be detrimental to the overall progress of the Project.

4.2 The Engineer's approval of the Contractor's Means and Methods of Construction, or his/her failure to exercise his/her right to reject such means or methods, shall not relieve the Contractor of its obligation to complete the Work as provided in this Contract; nor shall the exercise of such right to reject create a cause of action for damages.

ARTICLE 5. COMPLIANCE WITH LAWS

5.1 The Contractor shall comply with all Laws applicable to this Contract and to the Work to be done hereunder.

5.2 Procurement Policy Board Rules: This Contract is subject to the Rules of the PPB ("PPB Rules") in effect at the time of the bid opening for this Contract. In the event of a conflict between the PPB Rules and a provision of this Contract, the PPB Rules shall take precedence.

5.3 Noise control code provisions.

5.3.1 In accordance with the provisions of Section 24-216(b) of the Administrative Code of the City ("Administrative Code"), Noise Abatement Contract Compliance, devices and activities which will be operated, conducted, constructed or manufactured pursuant to this Contract and which are subject to the provisions of the City Noise Control Code shall be operated, conducted, constructed, or manufactured without causing a violation of the Administrative Code. Such devices and activities shall incorporate advances in the art of noise control development for the kind and level of noise

emitted or produced by such devices and activities, in accordance with regulations issued by the Commissioner of the Department of Environmental Protection.

5.3.2 The Contractor agrees to comply with Section 24-219 of the Administrative Code of the City ("Administrative Code") and implementing rules codified at 15 Rules of the City of New York ("RCNY") Section 28-100 et. seq. In accordance with such provisions, the Contractor, if the Contractor is the responsible party under such regulations, shall prepare and post a Construction Noise Mitigation Plan at each work site, in which the Contractor shall certify that all construction tools and equipment have been maintained so that they operate at normal manufacturers operating specifications. If the Contractor cannot make this certification, it must have in place an Alternative Noise Mitigation Plan approved by the New York City Department of Environmental Protection. In addition, the Contractor's certified Construction Noise Mitigation Plan is subject inspection by the Department of Environmental Protection in accordance with 15 RCNY §28-101. No Contract work may take place at a worksite unless there is a Construction Noise Mitigation Plan or approved Alternative Noise Mitigation Plan in place. In addition, the Contractor shall create and implement a noise mitigation training program. Failure to comply with these requirements may result in fines and other penalties pursuant to the applicable provisions of the Administrative Code and RCNY.

5.4 Ultra Low Sulfur Diesel Fuel: In accordance with the provisions of Section 24-163.3 of the Administrative Code, the Contractor specifically agrees as follows:

5.4.1 Definitions. For purposes of this Article 5.4, the following definitions apply:

5.4.1(a) "Contractor" means any person or entity that enters into a Public Works Contract with a City agency, or any person or entity that enters into an agreement with such person or entity, to perform work or provide labor or services related to such Public Works Contract

5.4.1(b) "Motor Vehicle" means any self-propelled vehicle designed for transporting persons or property on a street or highway.

5.4.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 or section 7521 of title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.4.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty horsepower and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers and similar equipment, except that this term shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five horsepower or less and that are not used in any construction program or project.

5.4.1(e) "Public Works Contract" means a contract with a City agency for a construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; a contract with a City agency for the preparation for any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; or a contract with a City agency for any final work involved in the completion of any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge.

5.4.1(f) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million.

5.4.2 Ultra Low Sulfur Diesel Fuel

5.4.2(a) All Contractors shall use Ultra Low Sulfur Diesel Fuel in diesel-powered Nonroad Vehicles in the performance of this Contract.

5.4.2(b) Notwithstanding the requirements of Article 5.4.2(a), Contractors may use diesel fuel that has a sulfur content of no more than thirty parts per million to fulfill the requirements of this Article 5.4.2, where the Commissioner of the New York City Department of Environmental Protection ("DEP Commissioner") has issued a determination that a sufficient quantity of Ultra Low Sulfur Diesel Fuel is not available to meet the needs of City agencies and Contractors. Any such determination shall expire after six months unless renewed.

5.4.2(c) Contractors shall not be required to comply with this Article 5.4.2 where the agency letting this contract makes a written finding, which is approved, in writing, by the DEP Commissioner, that a sufficient quantity of Ultra Low Sulfur Diesel Fuel, or diesel fuel that has a sulfur content of no more than thirty parts per million is not available to meet the requirements of Section 24-163.3 of the Administrative Code, provided that such Contractor in its fulfillment of the requirements of this Contract, to the extent practicable, shall use whatever quantity of Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million is available. Any finding made pursuant to this subdivision shall expire after sixty days, at which time the requirements of this Article 5.4.2 shall be in full force and effect unless the Agency renews the finding in writing and such renewal is approved by the DEP Commissioner.

5.4.2(d) Contractors may check on determinations and approvals issued by the DEP Commissioner pursuant to Section 24-163.3 of the Administrative Code, if any, at www.dep.nyc.gov or by contacting the Agency issuing this solicitation.

5.4.2(e) The requirements of this Article 5.4.2 do not apply where they are precluded by federal or State funding requirements or where the Contract is an emergency procurement.

5.4.3 Best Available Technology

5.4.3(a) All Contractors shall utilize the best available technology for reducing the emission of pollutants for diesel-powered Nonroad Vehicles in the performance of this Contract. For determinations of best available technology for each type of diesel-powered Nonroad Vehicle, Contractors shall comply with the regulations of the City Department of Environmental Protection, as and when adopted, Chapter 14 of Title 15 of the Rules of the City of New York (RCNY). The Contractor shall fully document all steps in the best available technology selection process and shall furnish such documentation to the Agency or the DEP Commissioner upon request. The Contractor shall retain all documentation generated in the best available technology selection process for as long as the selected best available technology is in use.

5.4.3(b) No Contractor shall be required to replace best available technology for reducing the emission of pollutants or other authorized technology utilized for a diesel-powered Nonroad Vehicle in accordance with the provisions of this Article 5.4.3 within three years of having first utilized such technology for such vehicle.

5.4.3(c) This Article 5.4.3 shall not apply to any vehicle used to satisfy the requirements of a specific Public Works Contract for fewer than twenty calendar days.

5.4.3(d) The Contractor shall not be required to comply with this Article 5.4.3 with respect to a diesel-powered Nonroad Vehicle under the following circumstances:

5.4.3(d)(1) Where the agency makes a written finding, which is approved, in writing, by the DEP Commissioner, that the best available technology for reducing the emission of pollutants as required by those paragraphs is unavailable for such vehicle, Contractor shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle.

5.4.3(d)(2) Where the DEP Commissioner has issued a written waiver based upon the Contractor having demonstrated to the DEP Commissioner that the use of the best available technology for reducing the emission of pollutants might endanger the operator of such vehicle or those working near such vehicle, due to engine malfunction, Contractor shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle, which would not endanger the operator of such vehicle or those working near such vehicle.

5.4.3(d)(3) In determining which technology to use for the purposes of Articles 5.4.3(d)(1) and 5.4.3(d)(2) above, Contractor shall primarily consider the reduction in emissions of particulate matter and secondarily consider the reduction in emissions of nitrogen oxides associated with the use of such technology, which shall in no event result in an increase in the emissions of either such pollutant.

5.4.3(d)(4) Contractors shall submit requests for a finding or a waiver pursuant to this Article 5.4.3(d) in writing to the DEP Commissioner, with a copy to the ACCO of the Agency issuing the solicitation. Any finding or waiver made or issued pursuant to Articles 5.4.3(d)(1) and 5.4.3(d)(2) above shall expire after one hundred eighty days, at which time the requirements of Article 5.4.3(a) shall be in full force and effect unless the Agency renews the finding, in writing, and the DEP Commissioner approves such finding, in writing, or the DEP Commissioner renews the waiver, in writing.

5.4.3(e) The requirements of this Article 5.4.3 do not apply where they are precluded by federal or State funding requirements or where the contract is an emergency procurement.

5.4.4 Section 24-163 of the Administrative Code. Contractors shall comply with Section 24-163 of the Administrative Code related to the idling of the engines of motor vehicles while parking.

5.4.5 Compliance

5.4.5(a) Contractor's compliance with Article 5.4 may be independently monitored. If it is determined that the Contractor has failed to comply with any provision of Article 5.4, any costs associated with any independent monitoring incurred by the City shall be reimbursed by the Contractor.

5.4.5(b) Any Contractor who violates any provision of Article 5.4, except as provided in Article 5.4.5(c) below, shall be liable for a civil penalty between the amounts of one thousand and ten thousand dollars, in addition to twice the amount of money saved by such Contractor for failure to comply with Article 5.4.

5.4.5(c) No Contractor shall make a false claim with respect to the provisions of Article 5.4 to a City agency. Where a Contractor has been found to have done so, such Contractor shall be liable for a civil penalty of twenty thousand dollars, in addition to twice the amount of money saved by such Contractor in association with having made such false claim.

5.4.6 Reporting

5.4.6(a) For all Public Works Contracts covered by this Article 5.4, the Contractor shall report to the Department the following information:

5.4.6(1) The total number of diesel-powered Nonroad Vehicles used to fulfill the requirements of this Public Works Contract;

5.4.6(2) The number of such Nonroad Vehicles that were powered by Ultra Low Sulfur Diesel Fuel;

5.4.6(3) The number of such Nonroad Vehicles that utilized the best available technology for reducing the emission of pollutants, including a breakdown by vehicle model and the type of technology;

5.4.6(4) The number of such Nonroad Vehicles that utilized such other authorized technology in accordance with Article 5.4.3, including a breakdown by vehicle model and the type of technology used for each such vehicle;

5.4.6(5) The locations where such Nonroad Vehicles were used; and

5.4.6(6) Where a determination is in effect pursuant to Article 5.4.2(b) or 5.4.2(c), detailed information concerning the Contractor's efforts to obtain Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million.

5.4.6(b) The Contractor shall submit the information required by Article 5.4.6(a) at the completion of work under the Public Works Contract and on a yearly basis no later than August 1 throughout the term of the Public Works Contract. The yearly report shall cover work performed the preceding fiscal year (July 1 - June 30).

5.5 Ultra Low Sulfur Diesel Fuel. In accordance with the Coordinated Construction Act for Lower Manhattan, as amended:

5.5.1 Definitions. For purposes of this Article 5.5, the following definitions apply:

5.5.1(a) "Lower Manhattan" means the area to the south of and within the following lines: a line beginning at a point where the United States pierhead line in the Hudson river as it exists now or may be extended would intersect with the southerly line of West Houston street in the borough of Manhattan extended, thence easterly along the southerly side of West Houston street to the southerly side of Houston street, thence easterly along the southerly side of Houston street to the southerly side of East Houston street, thence northeasterly along the southerly side of East Houston street to the point where it would intersect with the United States pierhead line in the East river as it exists now or may be extended, including tax lots within or immediately adjacent thereto.

5.5.1(b) "Lower Manhattan Redevelopment Project" means any project in Lower Manhattan that is funded in whole or in part with federal or State funding, or any project intended to improve transportation between Lower Manhattan and the two air terminals in the City of New York known as LaGuardia Airport and John F. Kennedy International Airport, or between Lower Manhattan and the air terminal in Newark known as Newark Liberty International Airport, and that is funded in whole or in part with federal funding.

5.5.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 or section 7521 of title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.5.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty horsepower and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers and similar equipment, except that this term shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five horsepower or less and that are not used in any construction program or project.

5.5.1(e) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million.

5.5.2 Requirements. Contractors and Subcontractors are required to use only Ultra Low Sulfur Diesel Fuel to power the diesel-powered Nonroad Vehicles with engine horsepower (HP) rating of 50 HP and above used on a Lower Manhattan Redevelopment Project and, where practicable, to reduce the emission of pollutants by retrofitting such Nonroad Vehicles with oxidation catalysts, particulate filters, or technology that achieves lowest particulate matter emissions.

5.6 Pesticides. In accordance with Section 17-1209 of the Administrative Code, to the extent that the Contractor or any Subcontractor applies pesticides to any property owned or leased by the City, the Contractor and any Subcontractor shall comply with chapter 12 of the Administrative Code.

ARTICLE 6. INSPECTION

6.1 During the progress of the Work and up to the date of Final Acceptance, the Contractor shall at all times afford the representatives of the City every reasonable, safe and proper facility for inspecting all Work done or being done at the Site and also for inspecting the manufacture or preparation of materials and equipment at the place of such manufacture or preparation.

6.2 The Contractor's obligation hereunder shall include the uncovering or taking down of finished Work and its restoration thereafter; provided, however, that the order to uncover, take down and restore shall be in writing, and further provided that if Work thus exposed proves satisfactory, and if the Contractor has complied with Article 6.1, such uncovering or taking down and restoration shall be considered an item of Extra Work to be paid for in accordance with the provisions of Article 26. If the Work thus exposed proves unsatisfactory, the City has no obligation to compensate the Contractor for the uncovering, taking down or restoration.

6.3 Inspection and approval by the Commissioner, the Engineer, Project Manager, or Resident Engineer, of finished Work or of Work being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the Contractor of its obligation to perform the Work in strict accordance with the Contract. Finished or unfinished Work not found to be in strict accordance with the Contract shall be replaced as directed by the Engineer, even though such Work may have been previously approved and paid for. Such corrective work is Contract Work and shall not be deemed Extra Work.

6.4 Rejected Work and materials shall be promptly taken down and removed from the Site, which must at all times be kept in a reasonably clean and neat condition.

**ARTICLE 7. PROTECTION OF WORK AND OF PERSONS
AND PROPERTY; NOTICES AND INDEMNIFICATION**

7.1 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall be under an absolute obligation to protect the finished and unfinished Work against any damage, loss, injury, theft and/or vandalism and in the event of such damage, loss, injury, theft and/or vandalism, it shall promptly replace and/or repair such Work at the Contractor's sole cost and expense, as directed by the Resident Engineer. The obligation to deliver finished Work in strict accordance with the Contract prior to Final Acceptance shall be absolute and shall not be affected by the Resident Engineer's approval of, or failure to prohibit, the Means and Methods of Construction used by the Contractor.

7.2 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall take all reasonable precautions to protect the persons and property of the City and of others from damage, loss or injury resulting from the Contractor's, and/or its Subcontractors' operations under this Contract. The Contractor's obligation to protect shall include the duty to provide, place or replace and adequately maintain at or about the Site suitable and sufficient protection such as lights, barricades, and enclosures.

7.3 The Contractor shall comply with the notification requirements set forth below in the event of any loss, damage or injury to Work, persons or property, or any accidents arising out of the operations of the Contractor and/or its Subcontractors under this Contract.

7.3.1 The Contractor shall make a full and complete report in writing to the Resident Engineer within three (3) Days after the occurrence.

7.3.2 The Contractor shall notify in writing the commercial general liability insurance carrier, and, where applicable, the worker's compensation and/or other insurance carrier, of any such loss, damage, injury, or accident, and any claim or suit arising therefrom, immediately, but not later than 20 days after such event. The Contractor's notice to the commercial general liability insurance carrier must expressly specify that "this notice is being given on behalf of the City of New York as Additional Insured as well as [the Contractor] as Named Insured." The Contractor's notice to the insurance carrier shall contain the following information: the name of the Contractor, the number of the Contract, the date of the occurrence, the location (street address and borough) of the occurrence, and the identity of the persons or things injured, damaged or lost.

7.3.2(a) At the time notice is provided to the insurance carrier(s), the Contractor shall provide copies of such notice to the Comptroller and the Commissioner. Notice to the Comptroller shall be sent to the Insurance Unit, NYC Comptroller's Office, 1 Centre Street – Room 1222, New York, New York, 10007. Notice to the Commissioner shall be sent to the address set forth in Schedule A of the General Conditions.

7.3.2(b) If the Contractor fails to provide any of the foregoing notices to any appropriate insurance carrier(s) in a timely and complete manner, the Contractor shall indemnify the City for all losses, judgments, settlements and expenses, including reasonable attorneys' fees, arising from an insurer's disclaimer of coverage citing late notice by or on behalf of the City.

7.4 To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold the City, its employees and agents (the "Indemnitees") harmless against any and all claims (including but not limited to claims asserted by any employee of the Contractor and/or its Subcontractors) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the operations of the Contractor and/or its Subcontractors in the performance of this Contract or from the Contractor's and/or its Subcontractors' failure to comply with any of the provisions of this Contract or of the Law. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article 7.4 by way of cross-claim, third-party

claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of law or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing or contributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of law, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis.

7.4.1 Indemnification under Article 7.4 or any other provision of the **Contract** shall operate whether or not **Contractor** or its **Subcontractors** have placed and maintained the insurance specified under Article 22.

7.5 The **Contractor** waives all rights against the **City** for any damages or losses for which either is covered under any insurance required under Article 22 (whether or not such insurance is actually procured) or any other insurance applicable to the operations of the **Contractor** and/or its **Subcontractors** in the performance of this **Contract**.

7.6 The provisions of this Article shall not be deemed to create any new right of action in favor of third parties against the **Contractor** or the **City**.

CHAPTER III **TIME PROVISIONS**

ARTICLE 8. COMMENCEMENT AND PROSECUTION OF THE WORK

8.1 The **Contractor** shall commence **Work** on the date specified in a written notice signed by the **Commissioner**. The time for performance of the **Work** under the **Contract** shall be computed from the date specified in such written notice. **TIME BEING OF THE ESSENCE** to the **City**, the **Contractor** shall thereafter prosecute the **Work** diligently, using such **Means and Methods of Construction** as are in accord with Article 4 herein and as will assure its completion not later than the date specified herein, or on the date to which the time for completion may be extended.

ARTICLE 9. PROGRESS SCHEDULES

9.1 To enable the **Work** to be performed in an orderly and expeditious manner, the **Contractor**, within fifteen (15) **Days** after the **Notice to Proceed** with this **Contract**, unless otherwise directed by the **Engineer**, shall submit to the **Engineer** a proposed progress schedule in the form of a bar graph or in such other form as specified by the **Engineer**, and monthly cash flow requirements, showing:

9.1.1 The anticipated time of commencement and completion of each of the various operations to be performed under this **Contract**; and

9.1.2 The sequence and interrelation of each of these operations with the others and with those of other related **Contracts**; and

9.1.3 The estimated time required for fabrication or delivery, or both, of all materials and equipment required for the **Work**; and

9.1.4 The estimated amount in dollars the **Contractor** will claim on a monthly basis.

9.2 The proposed schedule shall be revised as directed by the **Engineer**, until finally approved by the **Engineer**, and after such approval, subject to the provisions of Article 11, shall be strictly adhered to by the **Contractor**.

9.3 If the **Contractor** shall fail to adhere to the approved progress schedule, or to the schedule as revised pursuant to Article 11, it shall promptly adopt such other or additional **Means and Methods of Construction** as will make up for the time lost and will assure completion in accordance with the approved progress schedule. The approval by the City of a progress schedule which is shorter than the time allotted under the **Contract** shall not create any liability for the City if the approved progress schedule is not met.

9.4 The **Contractor** will not receive any payments until the proposed progress schedule is submitted.

ARTICLE 10. REQUESTS FOR INFORMATION OR APPROVAL

10.1 From time to time as the **Work** progresses and in the sequence indicated by the approved progress schedule, the **Contractor** shall submit to the **Engineer** a specific request in writing for each item of information or approval required by the **Contractor**. These requests shall state the latest date upon which the information or approval is actually required by the **Contractor**, and shall be submitted in a reasonable time in advance thereof to enable the **Engineer** a sufficient time to act upon such submissions, or any necessary re-submissions thereof.

10.2 The **Contractor** shall not have any right to an extension of time on account of delays due to the **Contractor's** failure to submit requests for the required information or the required approval in accordance with the above requirements.

ARTICLE 11. NOTICE OF CONDITIONS CAUSING DELAY AND DOCUMENTATION OF DAMAGES CAUSED BY DELAY

11.1 After the commencement of any condition which is causing or may cause a delay in completion of the **Work**, including conditions for which the **Contractor** may be entitled to an extension of time, the following notifications and submittals are required:

11.1.1 Within seven (7) **Days** after the commencement of such condition, the **Contractor** must notify the **Engineer** in writing of the existence, nature and effect of such condition upon the approved progress schedule and the **Work**, and must state why and in what respects, if any, the condition is causing or may cause a delay.

11.1.2 If the **Contractor** shall claim to be sustaining damages for delay as provided for in this Article, within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter for as long as such damages are being incurred, the **Contractor** shall submit to the **Commissioner** verified written statements of the details and the amounts of such damages, together with documentary evidence of such damages, ("statement of delay damages") as further detailed in Section 11.6. The **Contractor** may submit any of the above statements within such additional time as may be granted by the **Commissioner** in writing upon written request therefor. On failure of the **Contractor** to fully comply with all of the foregoing provisions, such claims shall be deemed waived and no right to recover on such claims shall exist. Damages that the **Contractor** may claim in any action arising under or by reason of this **Contract** shall not be different from or in excess of the statements made and documentation provided pursuant to this article.

11.1.3 Within 60 days of submission of the final verified statement of claims pursuant to Article 44, the **Commissioner** shall make a determination as to whether a compensable

delay has occurred and, if so, the amount of compensation due the **Contractor**. Notwithstanding the above, the **Commissioner** may make a determination as to whether a compensable delay has occurred at any time after the **Contractor's** first submission of a statement of delay damages.

11.2 Failure of the **Contractor** to strictly comply with the requirements of Article 11.1.1 may, in the discretion of the **Commissioner**, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition. Failure of the **Contractor** to strictly comply with the requirements of Articles 11.1.1 and 11.1.2 shall be deemed a conclusive waiver by the **Contractor** of any and all claims for damages for delay arising from such condition and no right to recover on such claims shall exist.

11.3 When appropriate and directed by the **Engineer**, the progress schedule shall be revised by the **Contractor** until finally approved by the **Engineer**. The revised progress schedule must be strictly adhered to by the **Contractor**.

11.4 Compensable Delays

11.4.1 The **Contractor** agrees to make claim only for additional costs attributable to delay in the performance of this **Contract** necessarily extending the time for completion of the **Work** or resulting from acceleration directed by the City and required to maintain the project schedule, occasioned solely by any act or omission to act of the City listed below. The **Contractor** also agrees that delay from any other cause shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**.

11.4.1.1 The failure of the City to take reasonable measures to coordinate and progress the **Work**, except that the City shall not be responsible for the **Contractor's** obligation to coordinate and progress the **Work** of its subcontractors.

11.4.1.2 Extended delays attributable to the City in the review or issuance of change orders, in shop drawing reviews and approvals or as a result of the cumulative impact of multiple change orders, which have a verifiable impact on project costs.

11.4.1.3 The unavailability of the site for an extended period of time that significantly affects the scheduled completion of the **contract**.

11.4.1.4 The issuance by the **Engineer** of a stop work order relative to a substantial portion of work for a period exceeding thirty days, that was not brought about through any action or omission of the **Contractor**.

11.4.1.5 Differing site conditions that were not known or reasonably ascertainable on a pre-bid inspection of the site or review of the bid documents or other publicly available sources and that are not ordinarily encountered in the **Project's** geographical area or neighborhood or in the type of work to be performed.

11.4.1.6 Delays caused by the City's bad faith or its willful, malicious, or grossly negligent conduct;

11.4.1.7 Delays not contemplated by the parties;

11.4.1.8 Delays so unreasonable that they constitute an intentional abandonment of the **Contract** by the City; and

11.4.1.9 Delays resulting from the City's breach of a fundamental obligation of the **Contract**.

11.4.2 The provisions of this Article apply only to claims for additional costs attributable to delay and do not preclude determinations by the **Commissioner** allowing reimbursements for additional costs for **Extra Work** pursuant to Articles 25 and 26 of this **Contract**. To the extent that any cost attributable to delay is reimbursed as part of a change order, no additional claim for compensation under this section shall be allowed.

11.5 Non-Compensable Delays. The **Contractor** agrees to make no monetary request for, and has included in its bid prices for the various items of the **Contract**, the extra/additional costs attributable to any delays

caused by or attributable to the items set forth below. For such items, the **Contractor** shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**, in accordance with the provisions of Article 13. Such extensions of time will be granted, if at all, pursuant to the grounds set forth in Article 13.3.

11.5.1 The acts or omissions of any third parties, including but not limited to other contractors, public/ governmental bodies (other than **City** agencies), utilities or private enterprises, who are disclosed in the contract documents or are ordinarily encountered or generally recognized as related to the **Work**;

11.5.2 Any situation which was within the contemplation of the parties at the time of entering into the **Contract**, including any delay indicated or disclosed in the contract documents or generally recognized as related to the nature of the **Work**, and/or the existence of any facility or appurtenance owned, operated or maintained by any third party, as indicated or disclosed in the contract documents or ordinarily encountered or generally recognized as related to the nature of the **Work**;

11.5.3 Restraining orders, injunctions or judgments issued by a court which were caused by a **Contractor's** submission, action or inaction or by a **Contractor's** means and methods of construction, or by third-parties, unless such order, injunction or judgment was the result of an action or omission by the **City**;

11.5.4 Any labor boycott, strike, picketing or similar situation;

11.5.5 Any shortages of supplies of materials required by the contract work;

11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes, or acts of war or of the public enemy or terrorist acts;

11.5.7 Extra work which does not significantly affect the overall completion of the contract, reasonable delays in the review or issuance of change orders or field orders and/or in shop drawing reviews or approvals.

11.6 Required Content of Submission of Statement of Delay Damages

11.6.1 In the verified written statement of delay damages required by Article 11.1.2, the following information shall be provided by the **Contractor**:

11.6.1.1 For each delay, the dates of the claimed periods of delay and, in addition, a description of the operations that were delayed, the reasons for the delay and an explanation of how they were delayed.

11.6.1.2 A detailed factual statement of the claim providing all necessary dates, locations and items of work affected by the claim.

11.6.1.3 The amount of additional compensation sought and a breakdown of that amount into categories as described in Article 26.2, subject to the limitations set forth in section 11.7.

11.6.1.4 Any additional information requested by the **Commissioner**.

11.7 Recoverable Costs

11.7.1 Delay damages may be recoverable for the following costs actually and necessarily incurred in the performance of the **Work**:

11.7.1.1 Labor;

11.7.1.2 Materials;

11.7.1.3 Equipment;

- 11.7.1.4 Extended Field Office Costs;
- 11.7.1.5 Extended Contract Site Overhead;
- 11.7.1.6 Extended Home office overhead; and
- 11.7.1.7 Insurance and Bond Costs.

11.7.2 Recoverable Subcontractor Costs. When the work is performed by a **Subcontractor**, the **Contractor** may be paid the actual and necessary costs of such subcontracted work as outlined above in 11.7.1.1 through 11.7.1.6, and an additional overhead of 5% of the costs outlined in 11.7.1.1 through 11.7.1.3.

11.7.3 Non-Recoverable Costs. The parties agree that the **City** will have no liability for the following items and the **Contractor** agrees it shall make no claim for the following items:

- 11.7.3.1 Profit, or loss of anticipated or unanticipated profit;
- 11.7.3.2 Consequential damages, including but not limited to interest on monies in dispute, including interest which is paid on such monies, loss of bonding capacity, bidding opportunities, or interest in investment, or any resulting insolvency;
- 11.7.3.3 Indirect costs or expenses of any nature;
- 11.7.3.4 Direct or indirect costs attributable to performance of work where the **Contractor**, because of situations or conditions within its control, has not progressed the work in a satisfactory manner; and
- 11.7.3.5 Attorneys' fees and dispute and claims preparation expenses.

11.8 Determinations under this Article 11 are not subject to the jurisdiction of the Contract Dispute Resolution Board pursuant to the dispute resolution process set forth in Article 27.

11.9 If the parties agree that a compensable delay has occurred and agree on the amount of compensation, payment may be made pursuant to a written change order, subject to pre-audit by the **Engineering Audit Officer**, and may be post-audited by the **Comptroller** and/or the **Department**.

ARTICLE 12. COORDINATION WITH OTHER CONTRACTORS

12.1 During the progress of the **Work**, **Other Contractors** may be engaged in performing other work or may be awarded other contracts for additional work on this **Project**. In that event, the **Contractor** shall coordinate the **Work** to be done hereunder with the work of such **Other Contractors** and the **Contractor** shall fully cooperate with such **Other Contractors** and carefully fit its own **Work** to that provided under other contracts as may be directed by the **Engineer**. The **Contractor** shall not commit or permit any act which will interfere with the performance of work by any **Other Contractors**.

12.2 If the **Engineer** shall determine that the **Contractor** is failing to coordinate its **Work** with the work of **Other Contractors** as the **Engineer** has directed, then the **Commissioner** shall have the right to withhold any payments otherwise due hereunder until the **Contractor** completely complies with the **Engineer's** directions.

12.3 The **Contractor** shall notify the **Engineer** in writing if any **Other Contractor** on this **Project** is failing to coordinate its work with the **Work** of this **Contract**. If the **Engineer** finds such charges to be true, the **Engineer** shall promptly issue such directions to the **Other Contractor** with respect thereto as the situation may require. The **City** shall not, however, be liable for any damages suffered by any **Other Contractor's** failure to coordinate its work with the **Work** of this **Contract** or by reason of the **Other Contractor's** failure to promptly comply with the directions so issued by the **Engineer**, or by reason of any **Other Contractor's** default in performance, it being understood that the **City** does not guarantee the responsibility or continued efficiency of any contractor. Except as provided for in Article 11.4.1.1, the **Contractor** agrees to make no claim against the **City** for

any damages relating to or arising out of any timely directions issued by the **Engineer** pursuant to this article (including but not limited to the failure of any **Other Contractor** to comply or promptly comply with such directions), or the failure of any **Other Contractor** to coordinate its work, or the default in performance of any **Other Contractor**.

12.4 The **Contractor** shall indemnify and hold the **City** harmless from any and all claims or judgments for damages and from costs and expenses to which the **City** may be subjected or which it may suffer or incur by reason of the **Contractor's** failure to comply with the **Engineer's** directions promptly; and the **Comptroller** shall have the right to exercise the powers reserved in Article 23 with respect to any claims which may be made for damages due to this **Contractor's** failure to comply with the **Engineer's** direction promptly. Insofar as the facts and Law relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by Law.

12.5 Should the **Contractor** sustain any damage through any act or omission of any **Other Contractor** having a contract with the **City** for the performance of work upon the **Site** or of work which may be necessary to be performed for the proper prosecution of the **Work** to be performed hereunder, or through any act or omission of a **Subcontractor** of such **Contractor**, the **Contractor** shall have no claim against the **City** for such damage, but shall have a right to recover such damage from the **Other Contractor** under the provision similar to the following provisions which apply to this **Contract** and have been or will be inserted in the contracts with such **Other Contractors**:

12.5.1 Should any **Other Contractor** having or who shall hereafter have a contract with the **City** for the performance of work upon the **Site** sustain any damage through any act or omission of the **Contractor** hereunder or through any act or omission of any **Subcontractor** of the **Contractor**, the **Contractor** agrees to reimburse such **Other Contractor** for all such damages and to defend at its own expense any suit based upon such claim and if any judgment or claims (even if the allegations of the suit are without merit) against the **City** shall be allowed the **Contractor** shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and agrees to indemnify and hold the **City** harmless from all such claims. Insofar as the facts and Law relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by Law.

12.6 The **City's** right to indemnification hereunder shall in no way be diminished, waived or discharged, by its recourse to assessment of liquidated damages as provided in Article 15, or by the exercise of any other remedy provided for by **Contract** or by Law.

ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE

13.1 If performance by the **Contractor** is delayed for a reason set forth in Article 13.3, the **Contractor** may be allowed a reasonable extension of time in conformance with this article and the PPB Rules.

13.2 Any extension of time may be granted only by the **Commissioner** or by the Board for the Extension of Time (hereafter "Board") (as set forth below) upon written application by the **Contractor**.

13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

13.3.1 By the acts or omissions of the **City**, its officers, agents or employees; or

13.3.2 By the act or omissions of **Other Contractors** on this Project; or

13.3.3 By supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, excessive inclement weather, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the **Contractor**).

13.3.4 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **Commissioner** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

13.4 The **Contractor** shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently; but, if at all, only for the actual period of delay in completion of the **Work** as determined by the **Commissioner** or the Board, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the **Contractor** or of its **Subcontractors** or **Materialmen**, and would of itself (irrespective of the concurrent causes) have delayed the **Work**, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

13.5 The determination made by the **Commissioner** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The granting of an application for an extension of time for causes of delay other than those herein referred to shall be entirely within the discretion of the **Commissioner** or the Board.

13.7 Permitting the **Contractor** to continue with the **Work** after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the **Contractor** after such time, shall in no way operate as a waiver on the part of the City of any of its rights under this **Contract**.

13.8 Application for Extension of Time:

13.8.1 Before the **Contractor's** time extension request will be considered, the **Contractor** shall notify the **Commissioner** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **Commissioner** identifying:

13.8.1(a) The **Contractor**; the registration number; and **Project** description;

13.8.1(b) Liquidated damage assessment rate, as specified in the **Contract**;

13.8.1(c) Original bid amount;

13.8.1(d) The original **Contract** start date and completion date;

13.8.1(e) Any previous time extensions granted (number and duration); and

13.8.1(f) The extension of time requested.

13.8.2 In addition, the application for extension of time shall set forth in detail:

13.8.2(a) The nature of each alleged cause of delay in completing the **Work**;

13.8.2(b) The date upon which each such cause of delay began and ended and the number of Days attributable to each such cause;

13.8.2(c) A statement that the **Contractor** waives all claims except for those delineated in the application, and the particulars of any claims which the **Contractor** does not agree to waive. For time extensions for **Substantial Completion** and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and

13.8.2(d) A statement indicating the **Contractor's** understanding that the time extension is granted only for purposes of permitting continuation of **Contract** performance and payment for **Work** performed and that the **City** retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

13.9 Analysis and Approval of Time Extensions:

13.9.1 For time extensions for partial payments, a written determination shall be made by the **Commissioner** who may, for good and sufficient cause, extend the time for the performance of the **Contract** as follows:

13.9.1(a) If the **Work** is to be completed within six (6) months, the time for performance may be extended for sixty (60) Days;

13.9.1(b) If the **Work** is to be completed within less than one (1) year but more than six (6) months, an extension of ninety (90) Days may be granted;

13.9.1(c) If the **Contract** period exceeds one (1) year, besides the extension granted in Article 13.9.1(b), an additional thirty (30) Days may be granted for each multiple of six (6) months involved beyond the one (1) year period; or

13.9.1(d) If exceptional circumstances exist, the **Commissioner** may extend the time for performance beyond the extensions in Articles 13.9.1(a), 13.9.1(b), and 13.9.1(c). In that event, the **Commissioner** shall file with the Mayor's Office of Contract Services a written explanation of the exceptional circumstances.

13.9.2 For extensions of time for **Substantial Completion** and final completion payments, the **Engineer**, in consultation with the **Commissioner**, shall prepare a written analysis of the delay (including a preliminary determination of the causes of delay, the beginning and end dates for each such cause of delay, and whether the delays are excusable under the terms of this **Contract**). The report shall be subject to review by and approval of the Board, which shall have authority to question its analysis and determinations and request additional facts or documentation. The report as reviewed and made final by the Board shall be made a part of the **Agency Contract** file. Neither the report itself nor anything contained therein shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

13.9.3 Approval Mechanism for Time Extensions for **Substantial Completion** or Final Completion Payments: An extension shall be granted only with the approval of the Board which is comprised of the **ACCO** of the **Agency**, the Corporation Counsel and the **Comptroller**, or their authorized representatives.

13.9.4 Neither the granting of any application for an extension of time to the **Contractor** or any other **Contractor** on this **Project** nor the papers, records or reports related to any application for or grant of an extension of time or determination related thereto shall be

referred to or offered in evidence by the **Contractor** or its attorneys in any action or proceeding.

13.10 **No Damage for Delay:** The **Contractor** agrees to make no claim for damages for delay in the performance of this **Contract** except as set forth in Article 11, and agrees that all it may be entitled to on account of any such delay for which compensation is not specifically provided for in Article 11 is an extension of time to complete performance of the **Work** as provided herein.

ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK

14.1 **Date for Substantial Completion:** The **Contractor** shall substantially complete the **Work** within the time fixed in Schedule A of the General Conditions, or within the time to which such **Substantial Completion** may be extended.

14.2 **Determining the Date of Substantial Completion:** The **Work** will be deemed to be substantially complete when the two conditions set forth in Articles 14.2.1 and 14.2.2 have been met. The **Commissioner** will then issue a Certificate of **Substantial Completion**.

14.2.1 **Inspection:** The **Engineer** has inspected the **Work** and has made a written determination that it is substantially complete.

14.2.2 **Approval of Final Punch List and Date for Final Acceptance:** Following inspection of the **Work**, the **Engineer** shall furnish the **Contractor** a final punch list, specifying all items of **Work** to be completed. The **Contractor** shall then submit to the **Engineer** dates for the completion of each specified item of **Work**. Within a reasonable time after receipt, the **Engineer**, in a written notification to the **Contractor**, shall approve the **Contractor's** completion dates or, if they are unable to agree, shall establish dates for the completion of each item of **Work**. The latest completion date specified shall be the date for **Final Acceptance** of the **Work**.

14.3 **Determining the Date of Final Acceptance:** The **Work** will be accepted as final and complete as of the date of the **Engineer's** inspection if, upon such inspection, the **Engineer** finds that all items on the **Final Approved Punch List** are complete and no further **Work** remains to be done. The **Commissioner** will then issue a written determination of **Final Acceptance**.

14.4 **Request for Inspection:** Inspection of the **Work** by the **Engineer** for the purpose of **Substantial Completion** or **Final Acceptance** shall be made within ten (10) **Days** after receipt of the **Contractor's** written request therefor.

14.5 **Request for Re-inspection:** If upon inspection for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer** determines that there are items of **Work** still to be performed, the **Contractor** shall promptly perform them and then request a re-inspection. If upon re-inspection, the **Engineer** determines that the **Work** is substantially complete or finally accepted, the date of such re-inspection shall be the date of **Substantial Completion** or **Final Acceptance**. Re-inspection by the **Engineer** shall be made within ten (10) **Days** after receipt of the **Contractor's** written request therefor.

14.6 **Initiation of Inspection by the Engineer:** If the **Contractor** does not request inspection or re-inspection of the **Work** for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer** may initiate such inspection or re-inspection.

ARTICLE 15. LIQUIDATED DAMAGES

15.1 In the event the **Contractor** fails to complete the **Work** within the time fixed for such completion in Schedule A of the General Conditions, plus authorized time extensions, or if the **Contractor**, in the sole determination of the **Commissioner**, has abandoned the **Work**, the **Contractor** shall pay to the **City** the sum fixed in Schedule A of the General Conditions, for each and every **Day** that the time consumed in completing the **Work** exceeds the time allowed therefor; which said sum, in view of the difficulty of accurately ascertaining the loss which the **City** will suffer by reason of delay in the completion of the **Work** hereunder, is hereby fixed and agreed as the liquidated damages that the **City** will suffer by reason of such delay, and not as a penalty. This article shall apply to the **Contractor** if it is defaulted pursuant to Chapter X of this **Contract**. Neither the failure to assess liquidated damages nor the granting of any time extension shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

15.2 Liquidated damages received hereunder are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the **City's** right to indemnification, or the **Contractor's** obligation to indemnify the **City**, or to any other remedy provided for in this **Contract** or by **Law**.

15.3 The **Commissioner** may deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the **City**, the **Contractor** shall be liable to pay the difference.

ARTICLE 16. OCCUPATION OR USE PRIOR TO COMPLETION

16.1 Unless otherwise provided for in the specifications, the **Commissioner** may take over, use, occupy or operate any part of the **Work** at any time prior to **Final Acceptance**, upon written notification to the **Contractor**. The **Engineer** shall inspect the part of the **Work** to be taken over, used, occupied, or operated, and will furnish the **Contractor** with a written statement of the **Work**, if any, which remains to be performed on such part. The **Contractor** shall not object to, nor interfere with, the **Commissioner's** decision to exercise the rights granted by this article. In the event the **Commissioner** takes over, uses, occupies, or operates any part of the **Work**:

16.1.1 the **Commissioner** shall issue a written determination of **Substantial Completion** with respect to such part of the **Work**;

16.1.2 the **Contractor** shall be relieved of its absolute obligation to protect such part of the unfinished **Work** in accordance with Article 7;

16.1.3 the **Contractor's** guarantee on such part of the **Work** shall begin on the date of such use by the **City**; and;

16.1.4 the **Contractor** shall be entitled to a return of so much of the amount retained in accordance with Article 21 as it relates to such part of the **Work**, except so much thereof as may be retained under Articles 24 and 44.

CHAPTER IV SUBCONTRACTS AND ASSIGNMENTS

ARTICLE 17. SUBCONTRACTS

17.1 The **Contractor** shall not make subcontracts totaling an amount more than the percentage of the total **Contract** price fixed in Schedule A of the General Conditions, without prior written permission from the **Commissioner**. All subcontracts made by the **Contractor** shall be in writing. No work may be performed by a

Subcontractor prior to the **Contractor** entering into a written subcontract with the **Subcontractor** and complying with the provisions of this Article 17.

17.2 Before making any subcontracts, the **Contractor** shall submit a written statement to the **Commissioner** giving the name and address of the proposed **Subcontractor**, the portion of the **Work** and materials which it is to perform and furnish, the cost of the subcontract, the VENDEX questionnaire if required, and any other information tending to prove that the proposed **Subcontractor** has the necessary facilities, skill, integrity, past experience and financial resources to perform the **Work** in accordance with the terms and conditions of this **Contract**.

17.3 If an approved **Subcontractor** elects to subcontract any portion of its subcontract, the proposed subcontract shall be submitted in the same manner as directed above.

17.4 The **Commissioner** will notify the **Contractor** in writing whether the proposed **Subcontractor** is qualified or not qualified. If the proposed **Subcontractor** is not qualified, the **Contractor** may submit another proposed **Subcontractor** unless the **Contractor** decides to do the **Work**. No **Subcontractor** shall be permitted on the **Site** unless approved.

17.5 Before entering into any subcontract hereunder, the **Contractor** shall inform the **Subcontractor** fully and completely of all provisions and requirements of this **Contract** relating either directly or indirectly to the **Work** to be performed and the materials to be furnished under such subcontract, and every such **Subcontractor** shall expressly stipulate that all labor performed and materials furnished by the **Subcontractor** shall strictly comply with the requirements of this **Contract**.

17.6 Documents given to a **Subcontractor** for the purpose of soliciting the **Subcontractor's** bid shall include either a copy of the bid cover or a separate information sheet setting forth the **Project** name, the **Contract** number (if available), the **Agency** (as noted in Article 2.1.6), and the **Project's** location.

17.7 The **Commissioner's** approval of a **Subcontractor** shall not relieve the **Contractor** of any of its responsibilities, duties and liabilities hereunder. The **Contractor** shall be solely responsible to the **City** for the acts or defaults of its **Subcontractor** and of such **Subcontractor's** officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the **Contractor** to the extent of its subcontract.

17.8 The **Contractor** shall be responsible for ensuring that all **Subcontractors** performing **Work** at the **Site** have either their own insurance coverage or are covered by the **Contractor's** insurance as required by Article 22.

17.9 The **Contractor** shall promptly, upon request, file with the **Engineer** a conformed copy of the subcontract and its cost. The subcontract shall provide the following:

17.9.1 **Payment to Subcontractors:** The agreement between the **Contractor** and its **Subcontractors** shall contain the same terms and conditions as to method of payment for **Work**, labor and materials, and as to retained percentages, as are contained in this **Contract**.

17.9.2 **Prevailing Rate of Wages:** The agreement between the **Contractor** and its **Subcontractors** shall include the prevailing wage rates and supplemental benefits to be paid in accordance with Labor Law Section 220.

17.9.3 **Section 6-123 of the Administrative Code:** Pursuant to the requirements of Section 6-123 of the Administrative Code, every agreement between the **Contractor** and its **Subcontractors** in excess of \$50,000 shall include a provision that the **Subcontractor** shall not engage in any unlawful discriminatory practice as defined in Title VIII of the Administrative Code (Section 8-101 et. seq.).

17.10 The **Commissioner** may deduct from the amounts certified under this **Contract** to be due to the **Contractor**, the sum or sums due and owing from the **Contractor** to the **Subcontractors** according to the terms of the said subcontracts, and in case of dispute between the **Contractor** and its **Subcontractor**, or **Subcontractors**, as to the amount due and owing, the **Commissioner** may deduct and withhold from the amounts certified under this **Contract** to be due to the **Contractor** such sum or sums as may be claimed by such **Subcontractor**, or **Subcontractors**, in a sworn affidavit, to be due and owing until such time as such claim or claims shall have been finally adjusted.

17.11 On **Contracts** where 100% performance bonds and payment bonds are executed, the **Contractor** shall include on each requisition for payment the following data: **Subcontractor's** name, value of the subcontract, total amount previously paid to **Subcontractor** for **Work** previously requisitioned, and the amount, including retainage, to be paid to the **Subcontractor** for **Work** included in the requisition.

17.12 On **Contracts** where performance bonds and payment bonds are not executed, the **Contractor** shall include with each requisition for payment submitted hereunder, a signed statement from each and every **Subcontractor** and/or **Materialman** for whom payment is requested in such requisition. Such signed statement shall be on the letterhead of the **Subcontractor** and/or **Materialman** for whom payment is requested and shall (i) verify that such **Subcontractor** and/or **Materialman** has been paid in full for all work performed and/or material supplied to date, exclusive of any amount retained and any amount included on the current requisition, and (ii) state the total amount of retainage to date, exclusive of any amount retained on the current requisition.

ARTICLE 18. ASSIGNMENTS

18.1 The **Contractor** shall not assign, transfer, convey or otherwise dispose of this **Contract**, or the right to execute it, or the right, title or interest in or to it or any part thereof, or assign, by power of attorney or otherwise any of the monies due or to become due under this **Contract**, unless the previous written consent of the **Commissioner** shall first be obtained thereto, and the giving of any such consent to a particular assignment shall not dispense with the necessity of such consent to any further or other assignments.

18.2 Such assignment, transfer, or conveyance shall not be valid until filed in the office of the **Commissioner** and the **Treasurer**, with the written consent of the **Commissioner** endorsed thereon or attached thereto.

18.3 Failure to obtain the previous written consent of the **Commissioner** to such an assignment, transfer or conveyance, may result in the revocation and annulment of this **Contract**. The **City** shall thereupon be relieved and discharged from any further liability to the **Contractor**, its assignees, transferees or sublessees, who shall forfeit and lose all monies therefor earned under the **Contract**, except so much as may be required to pay the **Contractor's** employees.

18.4 The provisions of this clause shall not hinder, prevent, or affect an assignment by the **Contractor** for the benefit of its creditors made pursuant to the **Laws** of the State of New York.

18.5 This **Contract** may be assigned by the **City** to any corporation, agency or instrumentality having authority to accept such assignment.

CHAPTER V
CONTRACTOR'S SECURITY AND GUARANTY

ARTICLE 19. SECURITY DEPOSIT

19.1 The bid deposit, if required, shall be retained by the **Comptroller** as security for the **Contractor's** faithful performance of the **Contract** and will be returned to the **Contractor** only after the sum retained under Article 21 equals the amount of the bid deposit, subject to the other provisions of this **Contract**. If performance and payment bonds are required, any bid security posted shall be returned within a reasonable time after posting of such bonds and execution of this **Contract** by the **City**. When no partial payments are provided, the bid deposit will be released when final payment is certified to the **Comptroller** for payment.

19.2 If the **Contractor** is declared in default under Article 48 prior to the return of the deposit, or if any claim is made such as referred to in Article 23, the amount of such deposit, or so much thereof as the **Comptroller** may deem necessary, may be retained and then applied by the **Comptroller**:

19.2.1 To compensate the **City** for any expense, loss or damage suffered or incurred by reason of or resulting from such default, including the cost of re-letting and liquidated damages; or

19.2.2 To indemnify the **City** against any and all claims.

ARTICLE 20. PAYMENT GUARANTEE

20.1 On **Contracts** where 100% performance bonds and payment bonds are executed, this article does not apply.

20.2 In the event the terms of this **Contract** do not require the **Contractor** to provide a payment bond, the **City** shall, in accordance with the terms of this article, guarantee payment of all lawful demands for:

20.2.1 Wages and compensation for labor performed and/or services rendered; and

20.2.2 Materials, equipment, and supplies provided, whether incorporated into the **Work** or not, when demands have been filed with the **City** as provided hereinafter by any person, firm, or corporation which furnished labor, material, equipment, supplies, or any combination thereof, in connection with the **Work** performed hereunder (hereinafter referred to as the "beneficiary") at the direction of the **City** or the **Contractor**.

20.3 The provisions of Article 20.2 are subject to the following limitations and conditions:

20.3.1 The guarantee is made for the benefit of all beneficiaries as defined in Article 20.2 provided that those beneficiaries strictly adhere to the terms and conditions of this Article 20.3.

20.3.2 Nothing in this article shall prevent a beneficiary providing labor, services or material for the **Work** from suing the **Contractor** for any amounts due and owing the beneficiary by the **Contractor**.

20.3.3 All demands made against the **City** pursuant to this article shall be made within four (4) months from the date payment is due on the invoice or invoices submitted by the beneficiary to the **Contractor** for labor or **Work** done or for materials or supplies delivered, or, if the demand is for wages, four (4) months from the date the wages were due to be paid to the beneficiary.

20.3.4 All demands made against the City by such beneficiary shall be presented to the **Engineer** along with all written documentation concerning the demand which the **Engineer** deems appropriate or necessary, which may include, but shall not be limited to: the subcontract; any invoices presented to the **Contractor** for payment; the notarized statement of the beneficiary that the demand is due and payable, that a request for payment has been made of the **Contractor** and that the demand has not been paid by the **Contractor** within the time allowed for such payment by the subcontract; and copies of any correspondence between the beneficiary and the **Contractor** concerning such demand. The City shall notify the **Contractor** that a demand has been made. The **Contractor** shall inform the City of any defenses to the demand, and shall forward to the City any documents the City requests concerning the demand.

20.3.5 The City shall make payment only if, after considering all defenses presented by the **Contractor**, it determines that the payment is due and owing to the beneficiary making the demand.

20.3.6 The City will not initiate the payment process of this article or make payment on a demand where the beneficiary making the demand has filed a lien against the Work or otherwise sues the City prior to receiving a written notice from the City that it will not pay the demand.

20.3.7 No beneficiary shall be entitled to interest from the City, or to any other costs, including, but not limited to, attorney's fees.

20.4 Upon the receipt by the City of a demand pursuant to this article, the City may withhold from any payment otherwise due and owing to the **Contractor** under this Contract an amount sufficient to satisfy the demand.

20.4.1 In the event the City determines that the demand is valid, the City shall notify the **Contractor** of such determination and the amount thereof, and direct the **Contractor** to immediately pay such amount to the beneficiary. In the event the **Contractor**, within seven (7) days of receipt of such notification from the City, fails to pay the beneficiary, such failure shall constitute an automatic and irrevocable assignment of payment by the **Contractor** to the beneficiary for the amount of the demand determined by the City to be valid. The **Contractor**, without further notification or other process, hereby gives its unconditional consent to such assignment of payment to the beneficiary and authorizes the City, on its behalf, to take all necessary actions to implement such assignment of payment, including without limitation the execution of any instrument or documentation necessary to effectuate such assignment.

In the event that the amount otherwise due and owing to the **Contractor** by the City is insufficient to satisfy such demand, the City may, at its option, require payment from the **Contractor** of an amount sufficient to cover such demand and exercise any other right to require or recover payment which the City may have under Law or Contract.

20.4.2 In the event the City determines that the demand is invalid, any amount withheld pending the City's review of such demand shall be paid to the **Contractor**; provided, however, no lien has been filed. In the event a lien has been filed, the terms and conditions set forth in Article 23 shall apply.

20.5 The provisions of this article shall not prevent the City and the **Contractor** from resolving disputes in accordance with the PPB Rules, where applicable.

20.6 In the event the City determines that the beneficiary is entitled to payment pursuant to this article, such determination and any defenses and counterclaims raised by the **Contractor** shall be taken into account in evaluating the **Contractor's** performance.

20.7 Nothing in this article shall relieve the **Contractor** of the obligation to pay the claims of all persons with valid and lawful claims against the **Contractor** relating to the **Work**.

20.8 The **Contractor** shall not require any performance, payment or other bonds of any **Subcontractor** if this **Contract** does not require such bonds of the **Contractor**.

20.9 The payment guarantee made pursuant to this article shall be construed in a manner consistent with Section 137 of the State Finance Law and shall afford to persons furnishing labor or materials to the **Contractor** or his **Subcontractors** in the prosecution of the **Work** under this **Contract** all of the rights and remedies afforded to such persons by such section, including but not limited to, the right to commence an action against the **City** on the payment guarantee provided by this article within the one year limitations period set forth in Section 137(4)(b).

ARTICLE 21. RETAINED PERCENTAGE

21.1 If this **Contract** requires 100% performance and payment security, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, five (5%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.2 If this **Contract** does not require 100% performance and payment security and if the price for which this **Contract** was awarded does not exceed \$500,000, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, ten (10%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.3 If this **Contract** does not require 100% performance and payment security and if the price for which this **Contract** was awarded exceeds \$500,000, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, up to ten (10%) percent of the value of **Work** certified for payment in each partial payment voucher. The percentage to be retained is set forth in Schedule A of the General Conditions.

ARTICLE 22. INSURANCE

22.1 Types of Insurance: From the date the **Contractor** is required to provide Proof of Insurance pursuant to Article 22.3.1 through the date of completion of all required **Work** (including punch list work as certified in writing by the **Resident Engineer**), the **Contractor** shall effect and maintain the following types of insurance if and as indicated in Schedule A of the General Conditions (with the minimum limits and special conditions specified in Schedule A). Such insurance shall be issued by companies that meet the standards of Article 22.2.1 and shall be primary (and non-contributing) to any insurance or self-insurance maintained by the **City**.

22.1.1 Commercial General Liability Insurance: The **Contractor** shall provide a Commercial General Liability Insurance policy covering the **Contractor** as Named Insured and the **City** as an Additional Insured. This policy shall protect the **City** and the **Contractor** from claims for property damage and/or bodily injury, including death, which may arise from any of the operations under this **Contract**. Coverage under this policy shall be at least as broad as that provided by ISO Form CG 0001 (10/01 ed.), must be "occurrence" based rather than "claims-made", and shall include, without limitation, the following types of coverage: Premises Operations, Products and Completed Operations, Contractual Liability (including the tort liability of another assumed in a contract), Broad Form Property Damage, Medical Payments, Independent Contractors, Personal Injury (Contractual Exclusion deleted), Explosion, Collapse and Underground Property, and Incidental Malpractice. If such insurance contains an aggregate limit, it shall apply separately to this **Project**.

22.1.1(a) Such Commercial General Liability Insurance shall name the City, together with its officials and employees, as an Additional Insured under this policy. Coverage for the City as Additional Insured shall specifically include the City's officials and employees, and shall be at least as broad as either Insurance Services Office ("ISO") Form CG 20 10 (07/04 ed.) or Form CG 20 33 (07/04 ed.) and shall provide completed operations coverage at least as broad as CG 20 37 (07/04 ed.).

22.1.1(b) If this Contract is equal to or greater than Ten Million Dollars (\$10,000,000.00), each Commercial General Liability Insurance policy provided shall contain each of the following endorsements:

22.1.1(b)(i) The Duties in the Event of Occurrence, Claim or Suit condition of the policy is amended per the following: If and insofar as knowledge of an "occurrence", "claim", or "suit" is relevant to the City of New York as Additional Insured under this policy, such knowledge by an agent, servant, official, or employee of the City of New York will not be considered knowledge on the part of the City of New York of the "occurrence", "claim", or "suit" unless the following position shall have received notice thereof from such agent, servant, official, or employee: Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department; and

22.1.1(b)(ii) Any notice, demand or other writing by or on behalf of the Named Insured to the Insurance Company shall also be deemed to be a notice, demand, or other writing on behalf of the City as Additional Insured. Any response by the Insurance Company to such notice, demand or other writing shall be addressed to Named Insured and to the City at the following addresses: Insurance Unit, NYC Comptroller's Office, 1 Centre Street - Room 1222, New York, N.Y. 10007; and Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, NY 10007.

22.1.2 Workers' Compensation Insurance and Disability Benefits Insurance: The Contractor shall provide, and ensure that each Subcontractor provides, Workers Compensation Insurance and Disability Benefits Insurance in accordance with the Laws of the State of New York on behalf of all employees providing services under this Contract (except for those qualifying for insurance pursuant to Article 22.1.4).

22.1.3 Employers' Liability Insurance: The Contractor shall provide, and ensure that each Subcontractor provides, Employers Liability Insurance affording compensation due to bodily injury by accident or disease sustained by any employee arising out of and in the course of his/her employment under this Contract (except for those qualifying for insurance pursuant to Article 22.1.4).

22.1.4 United States Longshoremen's and Harbor Workers Act and/or Jones Act Insurance: The Contractor shall provide, and ensure that each Subcontractor provides, insurance in accordance with the United States Longshoremen's and Harbor Workers Act and/or the Jones Act, on behalf of all qualifying employees providing services under this Contract.

22.1.5 Builders' Risk Insurance: The Contractor shall provide a Builders' Risk Insurance policy covering all risks in completed value form. Such policy shall cover the total value of the Work performed in accordance with Schedule A, as well as the value of any equipment, supplies and/or material for the Project that may be in storage (on or off the Site) or in transit. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by the operation of any law, ordinance or regulation, and for loss or damage to any owned, borrowed, leased or rented capital equipment, tools, including tools of their agents and employees, staging towers and forms,

and property of the City held in their care, custody and/or control. Such policy shall name as insureds the City, the Contractor, and its Subcontractors. The Builders' Risk policy shall contain the following endorsements:

22.1.5(a) The City and the Contractor shall be named as loss payee for the Work in order of precedence, as their interest may appear; and

22.1.5(b) In the event the loss occurs at an occupied facility, the policy shall permit occupancy without the consent of the Insurance Company; and

22.1.5(c) In the event that the insurance policy has been issued by a mutual insurance company, the following language shall be included: "The City of New York is not liable for any premium or assessment under this policy of insurance. The First Named Insured is solely liable therefor."

22.1.6 Comprehensive Business Automobile Liability Insurance: The Contractor shall provide a Comprehensive Business Automobile Liability policy for liability arising out of any owned, non-owned, leased and hired vehicles to be used in connection with this Contract. Coverage should be at least as broad as ISO Form CA0001, ed. 10/01.

22.1.6(a) If autos are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90.

22.1.7 Pollution/Environmental Liability Insurance: The Contractor shall provide Pollution/Environmental Liability Insurance covering bodily injury and property damage, including loss of use of damaged property or of property that has not been physically injured. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos) or in the investigation, settlement or defense of any claim, suit, or proceedings against the City arising from the operations under this Contract. Such insurance shall be in the Contractor's name and list the City as an Additional Insured. Coverage for the City as Additional Insured shall specifically include the City's officials and employees, and shall be at least as broad as provided to the Contractor for this Project.

22.1.7(a) If such coverage is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this Contract, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three years from the time the Work under this Contract is completed.

22.1.8 Marine Insurance:

22.1.8(a) Marine Protection and Indemnity Insurance: The Contractor shall provide a Marine Protection and Indemnity policy with coverage at least as broad as policy form SP-23. The policy shall provide coverage for the Contractor and for the City (together with its officials and employees) as Additional Insured for bodily injury and property damage arising from marine operations under this Contract including injury or death of crew members (if not fully provided through other insurance), damage to piers, wharves and other fixed or movable structures and loss of or damage to any other vessel or craft, or to property on such other vessel or craft, not caused by collision.

22.1.8(b) Ship Repairers Legal Liability Insurance: The Contractor shall provide a Ship Repairers Legal Liability Insurance policy covering all repair operations under this Contract at

or in the vicinity of a designated approved port or yard under this Contract. The policy shall provide coverage from the point of acceptance of care custody and control of any City vessel. The policy shall provide Bailee Coverage for any City vessel in the Contractor's care, custody and control and coverage for damage to property of others caused by any City vessel in the Contractor's care custody and control.

22.1.8(c) Collision Liability/Towers Liability Insurance: The Contractor shall provide a Collision Liability/Towers Liability Insurance policy with coverage for the Contractor and for the City (together with its officials and employees) as Additional Insured at least as broad as the American Institute Tug Form (08/01/76) for all tugs used under this Contract and Collision Liability per American Institute Hull Clauses (6/2/77).

22.1.8(d) Marine Pollution Liability Insurance: The Contractor shall provide a Marine Pollution Liability Insurance policy covering itself as Named Insured and the City (together with its officials and employees) as Additional Insured for liability arising from the discharge or substantial threat of a discharge of oil, or from the release or threatened release of a hazardous substance including injury to, or economic losses resulting from, the destruction of or damage to real property, personal property or natural resources. Coverage under this policy shall be at least as broad as that provided by Water Quality Insurance Syndicate Form (09/98 ed.).

22.1.9 The Contractor shall provide such other types of insurance, at such minimum limits, as are specified in Schedule A of the General Conditions.

22.2 General Requirements for Insurance Policies:

22.2.1 All required insurance policies shall be maintained with companies that may lawfully issue the required policy and have an A.M. Best rating of at least A- VII or a Standard and Poor's rating of at least AA, unless prior written approval is obtained from the Mayor's Office of Operations.

22.2.2 The Contractor shall be solely responsible for the payment of all premiums for all required policies and all deductibles and self-insured retentions to which such policies are subject, whether or not the City is an insured under the policy.

22.2.3 In his/her sole discretion, the Commissioner may, subject to the approval of the Comptroller and the Corporation Counsel, accept Letters of Credit and/or custodial accounts in lieu of required insurance.

22.2.4 The City's limits of coverage for all types of insurance required pursuant to Schedule A of the General Conditions shall be the greater of (i) the minimum limits set forth in Schedule A or (ii) the limits provided to the Contractor as Named Insured under all primary, excess and umbrella policies of that type of coverage.

22.2.5 All required insurance policies, except for insurance required pursuant to Sections 22.1.2, 22.1.3, and 22.1.4, shall contain the following endorsement: "This policy may not be cancelled, terminated, modified or changed unless thirty (30) days prior written notice is sent by the Insurance Company to the Named Insured (or First Named Insured, as appropriate), the Commissioner, and to the Comptroller, attn: Office of Contract Administration, Municipal Building, Room 1005, New York, New York 10007."

22.3 Proof of Insurance:

22.3.1 Within ten (10) Days of award, the **Contractor** shall, for each policy required under this **Contract**, except for Workers Compensation Insurance and Disability Benefits Insurance and builders' risk insurance, file a Certificate of Insurance with the **Commissioner** pursuant to Article 22.6. For Workers' Compensation Insurance and Disability Benefits Insurance, the **Contractor** shall file proof of insurance in a form acceptable to the **Commissioner** within ten (10) Days of award. Accord forms are not acceptable proof of workers' compensation coverage. The **Contractor** must submit one of the following forms to the Department, or another form acceptable to the Department: C-105.2 -- Certificate of Workers' Compensation Insurance, or U-26.3 -- State Insurance Fund Certificate of Workers' Compensation Insurance. For builders' risk insurance, the **Contractor** shall file a Certificate of Insurance with the **Commissioner** at the direction of the **Commissioner** but in any event no later than ten (10) Days prior to commencement of the **Work**.

22.3.1(a) All Certificates of Insurance shall be in a form acceptable to the **City** and shall certify the issuance and effectiveness of the types of insurance specified in Schedule A, each with the specified minimum limits and evidence of the compliance with the Additional Insured or Named Insured provisions of Articles 22.1.1(a), 22.1.5, 22.1.7, and 22.1.8, as applicable. All Certificate(s) of Insurance shall be accompanied by either a duly executed "Certification by Broker" in the form contained in Part II of Schedule A or completed copies of all policies referenced in the Certificate of Insurance. In the absence of completed policies, binders are acceptable.

22.3.2 Certificates of Insurance confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such Certificates of Insurance shall comply with the requirements of Article 22.3.1(a) and, if applicable, Article 22.3.1(b).

22.3.3 The **Contractor** shall be obligated to provide the **City** with a copy of any policy required by this Article 22 upon the demand for such policy by the **Commissioner** or the New York City Law Department.

22.4 Operations of the Contractor:

22.4.1 The **Contractor** shall not commence the **Work** unless and until all required certificates have been submitted to and accepted by the **Commissioner**. Acceptance by the **Commissioner** of a certificate hereunder does not excuse the **Contractor** from securing a policy consistent with all provisions of this Article or of any liability arising from its failure to do so.

22.4.2 The **Contractor** shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by this **Contract** and shall be authorized to perform **Work** only during the effective period of all required coverage.

22.4.3 In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the **Contractor** shall immediately stop all **Work**, and shall not recommence **Work** until authorized in writing to do so by the **Commissioner**. Upon quitting the **Site**, except as otherwise directed by the **Commissioner**, the **Contractor** shall leave all plant, materials, equipment, tools and supplies on the **Site**. **Contract** time shall continue to run during such periods and no extensions of time will be granted. The **Commissioner** may also declare the **Contractor** in default for failure to maintain required insurance.

22.5 The **City** as Additional Insured or Loss Payee under **Subcontractors'** Insurance. The **Contractor** shall ensure that each **Subcontractor** name the **City** as Additional Insured or loss payee, as appropriate, under all

policies covering Work performed by such Subcontractor under this Contract. The City's coverage as Additional Insured shall include the City's officials and employees and be at least as broad as that provided to the Contractor. The foregoing requirements shall not apply to insurance provided pursuant to Articles 22.1.2, 22.1.3, and 22.1.4.

22.6 Wherever reference is made in Article 7 or this Article 22 to documents to be sent to the Commissioner (e.g., notices, filings, or submissions), such documents shall be sent to the address set forth in Schedule A of the General Conditions. In the event no address is set forth in Schedule A, such documents are to be sent to the Commissioner's address as provided elsewhere in this Contract.

22.7 If the Contract involves disposal of hazardous materials, the Contractor shall dispose such materials only at sites where the disposal site operator maintains Pollution Legal Liability Insurance in the amount of at least \$2,000,000 for losses arising from such disposal site.

22.8 Materiality/Non-Waiver: The Contractor's failure to secure policy(ies) in complete conformity with this Article, or to give the Insurance Company timely notice of any sort required in this Contract on behalf of the City, or to do anything else required by this Article shall constitute a material breach of this Contract. Such breach shall not be waived or otherwise excused by any action or inaction by the City at any time.

22.9 Other Remedies: Insurance coverage in the minimum amounts provided for herein shall not relieve the Contractor or Subcontractors of any liability under this Contract, nor shall it preclude the City from exercising any rights or taking such other actions as are available to it under any other provisions of this Contract or Law.

ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If any claim shall be made by any person or entity (including Other Contractors with the City on this Project) against the City or against the Contractor and the City for any of the following:

(a) An alleged loss, damage, injury, theft or vandalism of any of the kinds referred to in Articles 7 and 12, plus the reasonable costs of defending the City, which in the opinion of the Comptroller may not be paid by an insurance company (for any reason whatsoever); or

(b) An infringement of copyrights, patents or use of patented articles, tools, etc., as referred to in Article 57; or

(c) Damage claimed to have been caused directly or indirectly by the failure of the Contractor to perform the Work in strict accordance with this Contract,

the amount of such claim, or so much thereof as the Comptroller may deem necessary, may be withheld by the Comptroller, as security against such claim, from any money due hereunder. The Comptroller, in his/her discretion, may permit the Contractor to substitute other satisfactory security in lieu of the monies so withheld.

23.2 If an action on such claim is timely commenced and the liability of the City, or the Contractor, or both, shall have been established therein by a final judgment of a Court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the Comptroller shall pay such judgment or admitted claim out of the monies retained by the Comptroller under the provisions of this article, and return the balance, if any, without interest, to the Contractor.

23.3 Liens: If at any time before or within thirty (30) Days after the Work is completed and accepted by the City, any persons claiming to have performed any labor or furnished any material toward the performance or completion of this Contract, shall file with the Agency and with the Treasurer any notice as is described in the

New York State Lien Law, or any act of the Legislature of the State of New York, the City shall retain, from the monies due or to become due under this **Contract**, so much of such monies as shall be sufficient to pay the amount claimed in said notice, together with the reasonable costs of any action or actions brought or that may be brought to enforce such lien. The monies so retained shall be held by the City until the lien thereon created by the said act and the filing of the said notice shall be discharged pursuant to Law.

ARTICLE 24. MAINTENANCE AND GUARANTY

24.1 The **Contractor** shall promptly repair, replace, restore or rebuild, as the **Commissioner** may determine, any finished **Work** in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of **Substantial Completion** (or use and occupancy in accordance with Article 16), except where other periods of maintenance and guarantee are provided for.

24.2 As security for the faithful performance of its obligations hereunder, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to one (1%) percent of the price (or the amount fixed in Schedule A of the General Conditions) in cash or certified check upon a state or national bank and trust company or a check of such bank and trust company signed by a duly authorized officer thereof and drawn to the order of the **Comptroller**, or obligations of the City, which the **Comptroller** may approve as of equal value with the sum so required.

24.3 In lieu of the above, the **Contractor** may make such security payment to the City by authorizing the **Commissioner** in writing to deduct the amount from the **Substantial Completion** payment which shall be deemed the deposit required above.

24.4 If the **Contractor** has faithfully performed all of its obligations hereunder the **Commissioner** shall so certify to the **Comptroller** within five (5) Days after the expiration of one (1) year from the date of **Substantial Completion** and acceptance of the **Work** or within thirty (30) Days after the expiration of the guarantee period fixed in the **Specifications**. The security payment shall be repaid to the **Contractor** without interest within thirty (30) Days after certification by the **Commissioner** to the **Comptroller** that the **Contractor** has faithfully performed all of its obligations hereunder.

24.5 Notice by the **Commissioner** to the **Contractor** to repair, replace, rebuild or restore such defective or damaged **Work** shall be timely, pursuant to this article, if given not later than ten (10) Days subsequent to the expiration of the one (1) year period or other periods provided for herein.

24.6 If the **Contractor** shall fail to repair, replace, rebuild or restore such defective or damaged **Work** promptly after receiving such notice, the **Commissioner** shall have the right to have the **Work** done by others in the same manner as provided for in the completion of a defaulted **Contract**, under Article 51.

24.7 If the security payment so deposited is insufficient to cover the cost of such **Work**, the **Contractor** shall be liable to pay such deficiency on demand by the **Commissioner**.

24.8 The **Engineer's** certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective **Work** when performed by one other than the **Contractor**, shall be binding and conclusive upon the **Contractor** as to the amount thereof.

24.9 The **Contractor** shall obtain all manufacturers' warranties and guaranties of all equipment and materials required by this **Contract** in the name of the City and shall deliver same to the **Commissioner**. All of the City's rights and title and interest in and to said manufacturers' warranties and guaranties may be assigned by the City to any subsequent purchasers or lessees of the premises.

CHAPTER VI
CHANGES, EXTRA WORK AND DOCUMENTATION OF CLAIM

ARTICLE 25. CHANGES

25.1 Changes may be made to this Contract only as duly authorized in writing by the Commissioner in accordance with the Laws and this Contract. All such changes, modifications and amendments will become a part of the Contract. Work so ordered shall be performed by the Contractor.

25.2 Contract changes will be made only for Work necessary to complete the Work included in the original scope of the Contract and/or for non-material changes to the scope of the Contract. Changes are not permitted for any material alteration in the scope of Work in the Contract.

25.3 The Contractor shall be entitled to a price adjustment for Extra Work performed pursuant to a written change order. Adjustments to price shall be computed in one or more of the following ways:

25.3.1 By applicable unit prices specified in the Contract; and/or

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

25.3.4 In any other manner approved by the CCPO.

25.4 All payments for change orders are subject to pre-audit by the Engineering Audit Officer and may be post-audited by the Comptroller and/or the Department.

ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

26.1 Overrun of Unit Price Item: An overrun is any quantity of a unit price item which the Contractor is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

26.1.1 For any unit price item, the Contractor will be paid at the unit price bid for any quantity up to one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the Work, the actual quantity of any unit price item required to complete the Work approaches the estimated quantity for that item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the Work will exceed the estimated quantity for that item by twenty-five (25%) percent, the Contractor shall immediately notify the Engineer of such anticipated overrun. The Contractor shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the Engineer.

26.1.2 If the actual quantity of any unit price item necessary to complete the Work will exceed one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the City reserves the right and the Contractor agrees to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the City and Contractor cannot agree on a new unit price, then the City shall order the Contractor and the Contractor agrees to provide additional quantities of the item on a time and material basis for the actual and reasonable cost as determined under Article 26.2, but in no event at a unit price exceeding the unit price bid.

26.2 **Extra Work:** For Extra Work where payment is by agreement on a fixed price in accordance with Article 25.3.2, the price to be paid for such Extra Work shall be based on the fair and reasonable estimated cost of the items set forth below. For Extra Work where payment is on a time and material basis in accordance with Article 25.3.3, the price to be paid for such Extra Work shall be the actual and reasonable cost of the items set forth below.

26.2.1 Necessary materials (including transportation to the Site); plus

26.2.2 Necessary direct labor, including payroll taxes and supplemental benefits; plus

26.2.3 Sales and personal property taxes, if any, required to be paid on materials not incorporated into such Extra Work; plus

26.2.4 Reasonable rental value of Contractor-owned, necessary plant and equipment other than small tools, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour: $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$. Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by PRIMEDIA (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by PRIMEDIA (the "Blue Book"). The reasonable rental value is inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five percent of such rental rates; second shift shall be sixty percent of the first shift rate; and third shift shall be forty percent of the first shift rate. Equipment on standby shall be reimbursed at one-third the prorated monthly rental rate. Contractor-owned equipment includes equipment from rental companies affiliated with or controlled by the Contractor, as determined by the Commissioner. In establishing cost reimbursement for non-operating contractor-owned equipment (scaffolding, sheeting systems, road plates, etc.), the City may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

26.2.5 Necessary installation and dismantling of such plant and equipment, including transportation to and from the Site, if any, provided that, in the case of non-Contractor-owned equipment rented from a third party, the cost of installation and dismantling are not allowable if such costs are included in the rental rate; plus

26.2.6 Reasonable rental costs of non-Contractor-owned necessary plant and equipment other than small tools, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per hour of operation: $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$. In lieu of renting, the City reserves the right to direct the purchase of non-operating equipment (scaffolding, sheeting systems, road plates, etc.), with payment on a purchase-salvage/life cycle basis, if less than the projected rental costs; plus

26.2.7 Workers' compensation insurance, and any insurance coverage expressly required by the City for the performance of the Extra Work which is different than the types of insurance required by Article 22 and Schedule A of the General Conditions. The cost of workers' compensation insurance shall be based upon the Manual Rate for such insurance for the applicable work classifications/codes, in accordance with the most recent schedule promulgated by the New York Compensation Insurance Rating Board; plus

26.2.8 Additional costs incurred as a result of the Extra Work for performance and payment bonds; plus

26.2.9 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5 as compensation for overhead, except that no percentage for overhead will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes. Overhead shall include without limitation, all costs and expenses in connection with administration, management superintendence, small tools, and insurance required by Schedule A of the General Conditions other than workers' compensation insurance; plus

26.2.10 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus item 26.2.9, as compensation for profit, except that no percentage for profit will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes; plus

26.2.11 Five (5%) percent of the total of items in Article 26.2.6, 26.2.7, and 26.2.8 as compensation for overhead and profit.

26.3 Where the **Extra Work** is performed in whole or in part by other than the **Contractor's** own forces pursuant to Article 26.2, the **Contractor** shall be paid, subject to pre-audit by the **Engineering Audit Officer**, the cost of such **Work** computed in accordance with Article 26.2 above, plus an additional allowance of five (5%) percent to cover the **Contractor's** overhead and profit.

26.4 Where a change is ordered, involving both **Extra Work** and omitted or reduced **Contract Work**, the **Contract** price shall be adjusted, subject to pre-audit by the **EAO**, in an amount based on the difference between the cost of such **Extra Work** and of the omitted or reduced **Work**. The cost of such **Extra Work** and of such omitted or reduced **Work** shall be computed based upon applicable **Contract** unit prices. Where there are no applicable **Contract** unit prices, the cost of such **Extra Work** and of such omitted or reduced **Contract Work** shall be computed in accordance with items 26.2.1 through 26.2.8. If the cost of such **Extra Work** exceeds the costs of such omitted or reduced **Contract Work**, the **Contract** price shall be increased by the difference, plus percentages for overhead and profit as provided in Articles 26.2.9 through 26.2.11. If the cost of the omitted or reduced **Contract Work** exceeds the cost of the **Extra Work**, then the **Contract** price shall be reduced by the difference.

26.5 Where the **Contractor** and the **Commissioner** can agree upon a fixed price for **Extra Work** in accordance with Article 25.3.2 or another method of payment for **Extra Work** in accordance with Article 25.3.4, or for **Extra Work** ordered in connection with omitted work, such method, subject to pre-audit by the **EAO**, may, at the option of the **Commissioner**, be substituted for the cost plus a percentage method provided in Article 26.2; provided, however, that if the **Extra Work** is performed by a **Subcontractor**, the **Contractor** shall not be entitled to receive more than an additional allowance of five (5%) percent for overhead and profit over the cost of such **Subcontractor's Work** as computed in accordance with Article 26.2.

ARTICLE 27. RESOLUTION OF DISPUTES

27.1 All disputes between the **City** and the **Contractor** of the kind delineated in this article that arise under, or by virtue of, this **Contract** shall be finally resolved in accordance with the provisions of this article and the **PPB Rules**. This procedure for resolving all disputes of the kind delineated herein shall be the exclusive means of resolving any such disputes.

27.1.1 This article shall not apply to disputes concerning matters dealt with in other sections of the **PPB Rules**, or to disputes involving patents, copyrights, trademarks, or trade secrets (as interpreted by the courts of New York State) relating to proprietary rights in computer software.

27.1.2 This article shall apply only to disputes about the scope of work delineated by the **Contract**, the interpretation of **Contract** documents, the amount to be paid for **Extra Work** or disputed work performed in connection with the **Contract**, the conformity of the **Contractor's Work** to the

Contract, and the acceptability and quality of the **Contractor's Work**; such disputes arise when the **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner** makes a determination with which the **Contractor** disagrees.

27.2 All determinations required by this article shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented to the party making the determination. Failure to make such determination within the time required by this article shall be deemed a non-determination without prejudice that will allow application to the next level.

27.3 During such time as any dispute is being presented, heard, and considered pursuant to this article, the **Contract** terms shall remain in force and the **Contractor** shall continue to perform **Work** as directed by the **ACCO** or the **Engineer**. Failure of the **Contractor** to continue **Work** as directed shall constitute a waiver by the **Contractor** of its claim.

27.4 Presentation of Disputes to Commissioner.

Notice of Dispute and Agency Response. The **Contractor** shall present its dispute in writing ("Notice of Dispute") to the **Commissioner** within thirty (30) Days of receiving written notice of the determination or action that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the **Contract**. The Notice of Dispute shall include all the facts, evidence, documents, or other basis upon which the **Contractor** relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the **Contractor** in the dispute was arrived at. Within thirty (30) Days after receipt of the detailed written submission comprising the complete Notice of Dispute, the **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner** shall submit to the **Commissioner** all materials he or she deems pertinent to the dispute. Following initial submissions to the **Commissioner**, either party may demand of the other the production of any document or other material the demanding party believes may be relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise protected by a legal privilege recognized by the courts of New York State. Any question of relevancy shall be determined by the **Commissioner** whose decision shall be final. Willful failure of the **Contractor** to produce any requested material whose relevancy the **Contractor** has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the **Contractor** of its claim.

27.4.1 **Commissioner Inquiry.** The **Commissioner** shall examine the material and may, in his or her discretion, convene an informal conference with the **Contractor**, the **ACCO**, and the **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner** to resolve the issue by mutual consent prior to reaching a determination. The **Commissioner** may seek such technical or other expertise as he or she shall deem appropriate, including the use of neutral mediators, and require any such additional material from either or both parties as he or she deems fit. The **Commissioner's** ability to render, and the effect of, a decision hereunder shall not be impaired by any negotiations in connection with the disputed presented, whether or not the **Commissioner** participated therein. The **Commissioner** may or, at the request of any party to the dispute, shall compel the participation of any other **Contractor** with a **Contract** related to the **Work** of this **Contract**, and that **Contractor** shall be bound by the decision of the **Commissioner**. Any **Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this article as the **Contractor** initiating the dispute.

27.4.2 **Commissioner Determination.** Within thirty (30) days after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the **Commissioner** shall make his or her determination and shall deliver or send a copy of such determination to the **Contractor**, the **ACCO**, and **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner**, as applicable, together with a statement concerning how the decision may be appealed.

27.4.3 Finality of Commissioner Decision. The Commissioner's decision shall be final and binding on all parties, unless presented to the Contract Dispute Resolution Board pursuant to this article. The City may not take a petition to the Contract Dispute Resolution Board. However, should the Contractor take such a petition, the City may seek, and the Contract Dispute Resolution Board may render, a determination less favorable to the Contractor and more favorable to the City than the decision of the Commissioner.

27.5 Presentation of Dispute to the Comptroller. Before any dispute may be brought by the Contractor to the Contract Dispute Resolution Board, the Contractor must first present its claim to the Comptroller for his or her review, investigation, and possible adjustment.

27.5.1 Time, Form, and Content of Notice. Within thirty (30) days of its receipt of a decision by the Commissioner, the Contractor shall submit to the Comptroller and to the Commissioner a Notice of Claim regarding its dispute with the Agency. The Notice of Claim shall consist of (i) a brief Written statement of the substance of the dispute, the amount of money, if any, claimed and the reason(s) the Contractor contends the dispute was wrongly decided by the Commissioner; (ii) a copy of the written decision of the Commissioner; and (iii) a copy of all materials submitted by the Contractor to the Agency, including the Notice of Dispute. The Contractor may not present to the Comptroller any material not presented to the Commissioner, except at the request of the Comptroller.

27.5.2 Agency Response. Within thirty (30) days of receipt of the Notice of Claim, the Agency shall make available to the Comptroller a copy of all material submitted by the Agency to the Commissioner in connection with the dispute. The Agency may not present to the Comptroller any material not presented to the Commissioner except at the request of the Comptroller.

27.5.3 Comptroller Investigation. The Comptroller may investigate the claim in dispute and, in the course of such investigation, may exercise all powers provided in section 7-201 and 7-203 of the New York City Administrative Code. In addition, the Comptroller may demand of either party, and such party shall provide, whatever additional material the Comptroller deems pertinent to the claim, including original business records of the Contractor. Willful failure of the Contractor to produce within fifteen (15) days any material requested by the Comptroller shall constitute a waiver by the Contractor of its claim. The Comptroller may also schedule an informal conference to be attended by the Contractor, Agency representatives, and any other personnel desired by the Comptroller.

27.5.4 Opportunity of Comptroller to Compromise or Adjust Claim. The Comptroller shall have forty-five (45) days from his or her receipt of all materials referred to in Article 27.5.3 to investigate the disputed claim. The period for investigation and compromise may be further extended by agreement between the Contractor and the Comptroller, to a maximum of ninety (90) days from the Comptroller's receipt of all materials. The Contractor may not present its petition to the Contract Dispute Resolution Board until the period for investigation and compromise delineated in Article 27.5.4 has expired. In compromising or adjusting any claim hereunder, the Comptroller may not revise or disregard the terms of the Contract between the parties.

27.6 Contract Dispute Resolution Board. There shall be a Contract Dispute Resolution Board composed of:

27.6.1 The chief administrative law judge of the Office of Administrative Trials and Hearings (OATH) or his/her designated OATH administrative law judge, who shall act as chairperson, and may adopt operational procedures and issue such orders consistent with this article as may be necessary in the execution of the Contract Dispute Resolution Board's functions, including, but not limited to, granting extensions of time to present or respond to submissions;

27.6.1.1 The **CCPO** or his/her designee; any designee shall have the requisite background to consider and resolve the merits of the dispute and shall not have participated personally and substantially in the particular matter that is the subject of the dispute or report to anyone who so participated; and

27.6.2 A person with appropriate expertise who is not an employee of the City. This person shall be selected by the presiding administrative law judge from a prequalified panel of individuals, established and administered by OATH with appropriate background to act as decision-makers in a dispute. Such individual may not have a contract or dispute with the City or be an officer or employee of any company or organization that does, or regularly represents persons, companies, or organizations having disputes with the City.

27.7 Petition to the Contract Dispute Resolution Board. In the event the claim has not been settled or adjusted by the **Comptroller** within the period provided in this article, the **Contractor**, within thirty (30) days thereafter, may petition the Contract Dispute Resolution Board to review the **Commissioner's** determination.

27.7.1 Form and Content of Petition by **Contractor**. The **Contractor** shall present its dispute to the Contract Dispute Resolution Board in the form of a petition, which shall include (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed, and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written Decision of the **Commissioner**; (iii) copies of all materials submitted by the **Contractor** to the Agency; (iv) a copy of the written decision of the **Comptroller**, if any; and (v) copies of all correspondence with, or written material submitted by the **Contractor**, to the **Comptroller**. The **Contractor** shall concurrently submit four (4) complete sets of the Petition: one set to the Corporation Counsel (Attn: Commercial and Real Estate Litigation Division) and three (3) sets to the Contract Dispute Resolution Board at OATH's offices with proof of service on the Corporation Counsel. In addition, the **Contractor** shall submit a copy of the written statement of the substance of the dispute, cited in (i) above, to both the **Commissioner** and the **Comptroller**.

27.7.2 Agency Response. Within thirty (30) Days of its receipt of the petition by the Corporation Counsel, the **Agency** shall respond to the brief written statement of the **Contractor** and make available to the Contract Dispute Resolution Board all material it submitted to the **Commissioner** and **Comptroller**. Three (3) complete copies of the **Agency** response shall be provided to the Contract Dispute Resolution Board and one to the **Contractor**. Extensions of time for submittal of the **Agency** response shall be given as necessary upon a showing of good cause or, upon consent of the parties, for an initial period of up to thirty (30) Days.

27.7.3 Further Proceedings. The Contract Dispute Resolution Board shall permit the **Contractor** to present its case by submission of memoranda, briefs, and oral argument. The Contract Dispute Resolution Board shall also permit the **Agency** to present its case in response to the **Contractor** by submission of memoranda, briefs, and oral argument. If requested by the Corporation Counsel, the **Comptroller** shall provide reasonable assistance in the preparation of the **Agency's** case. Neither the **Contractor** nor the **Agency** may support its case with any documentation or other material that was not considered by the **Comptroller**, unless requested by the Contract Dispute Resolution Board. The Contract Dispute Resolution Board, in its discretion, may seek such technical or other expert advice as it shall deem appropriate and may seek, on its own or upon application of a party, any such additional material from any party as it deems fit. The Contract Dispute Resolution Board, in its discretion, may combine more than one dispute between the parties for concurrent resolution.

27.7.4 Contract Dispute Resolution Board Determination. Within forty-five (45) Days of the conclusion of all written submissions and oral arguments, the Contract Dispute Resolution Board shall render a written decision resolving the dispute. In an unusually complex case, the Contract Dispute Resolution Board may render its decision in a longer period, not to exceed ninety (90) Days, and shall

so advise the parties at the commencement of this period. The Contract Dispute Resolution Board's decision must be consistent with the terms of the **Contract**. Decisions of the Contract Dispute Resolution Board shall only resolve matters before the Contract Dispute Resolution Board and shall not have precedential effect with respect to matters not before the Contract Dispute Resolution Board.

27.7.5 Notification of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board shall send a copy of its decision to the **Contractor**, the **ACCO**, the **Engineer**, the **Comptroller**, the **Corporation Counsel**, the **Director of the Office of Construction**, and the **PPB**. A decision in favor of the **Contractor** shall be subject to the prompt payment provisions of the **PPB Rules**. The **Required Payment Date** shall be thirty (30) Days after the date the parties are formally notified of the Contract Dispute Resolution Board's decision.

27.7.6 Finality of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board's decision shall be final and binding on all parties. Any party may seek review of the Contract Dispute Resolution Board's decision solely in the form of a challenge, filed within four (4) months of the date of the Contract Dispute Resolution Board's decision, in a court of competent jurisdiction of the State of New York, County of New York pursuant to Article 78 of the Civil Practice Laws and Rules. Such review by the court shall be limited to the question of whether or not the Contract Dispute Resolution Board's decision was made in violation of lawful procedure, was affected by an error of Law, or was arbitrary and capricious or an abuse of discretion. No evidence or information shall be introduced or relied upon in such proceeding that was not presented to the Contract Dispute Resolution Board in accordance with this article.

27.8 Any termination, cancellation, or alleged breach of the **Contract** prior to or during the pendency of any proceedings pursuant to this article shall not affect or impair the ability of the **Commissioner** or Contract Dispute Resolution Board to make a binding and final decision pursuant to this article.

ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK

28.1 While the **Contractor** or any of its **Subcontractors** is performing **Extra Work** on a Time and Material Basis ordered by the **Commissioner** under Article 25, or is performing **disputed Work**, or complying with a determination or order under protest in accordance with Articles 27 and 30, in each such case the **Contractor** shall furnish the **Resident Engineer** daily with three (3) copies of written statements signed by the **Contractor's** representative at the **Site** showing:

28.1.1 The name and number of each **Worker** employed on such **Work** or engaged in complying with such determination or order, the number of hours employed, and the character of the **Work** each is doing; and

28.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such **Work** or compliance with such determination or order, and from whom purchased or rented.

28.2 A copy of such statement will be countersigned by the **Resident Engineer**, noting thereon any items not agreed to or questioned, and will be returned to the **Contractor** within two (2) Days after submission.

28.3 The **Contractor** and its **Subcontractors**, when required by the **Commissioner**, or the **Comptroller**, shall also produce for inspection, at the office of the **Contractor** or **Subcontractor**, any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries and reports, and cancelled checks, and any other documents relating to showing the nature and quantity of the labor, materials, plant and equipment actually used in the performance of such **Work**, or in complying with such determination or order, and the amounts

expended therefor, and shall permit the **Commissioner** and the **Comptroller** to make such extracts therefrom, or copies thereof, as they or either of them may desire.

28.4 In connection with the examination provided for herein, the **Commissioner**, upon demand therefor, will produce for inspection by the **Contractor** such records as the **Agency** may have with respect to such **Extra** or disputed **Work** performed under protest pursuant to order of the **Commissioner**, except those records and reports which may have been prepared for the purpose of determining the accuracy and validity of the **Contractor's** claim.

28.5 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such **Work** or compliance with such determination or order.

ARTICLE 29. OMITTED WORK

29.1 If any **Contract Work** in a lump sum **Contract**, or if any part of a lump sum item in a unit price, lump sum, or percentage-bid **Contract** is omitted by the **Commissioner** pursuant to Article 33, the **Contract** price, subject to audit by the **EAO**, shall be reduced by a pro rata portion of the lump sum bid amount based upon the percent of **Work** omitted subject to Article 29.4. For the purpose of determining the pro rata portion of the lump sum bid amount, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be the determining factor.

29.2 If the whole of a lump sum item or units of any other item is so omitted by the **Commissioner** in a unit price, lump sum, or percentage-bid **Contract**, then no payment will be made therefor except as provided in Article 29.4.

29.3 For units that have been ordered but are only partially completed, the unit price shall be reduced by a pro rata portion of the unit price bid based upon the percentage of **Work** omitted subject to Article 29.4.

29.4 In the event the **Contractor**, with respect to any omitted **Work**, has purchased any non-cancelable material and/or equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated into the **Work**, the **Contractor** shall be paid for such material and/or equipment in accordance with Article 64.2.1(b); provided, however, such payment is contingent upon the **Contractor's** delivery of such material and/or equipment in acceptable condition to a location designated by the **City**.

29.5 The **Contractor** agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted **Work**.

ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES; PRODUCTION OF FINANCIAL RECORDS

30.1 If the **Contractor** shall claim to be sustaining damages by reason of any act or omission of the **City** or its agents, it shall submit to the **Commissioner** within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter for as long as such damages are incurred, verified statements of the details and the amounts of such damages, together with documentary evidence of such damages. The **Contractor** may submit any of the above statements within such additional time as may be granted by the **Commissioner** in writing upon written request therefor. Failure of the **Commissioner** to respond in writing to a written request for additional time within thirty (30) **Days** shall be deemed a denial of the request. On failure of the **Contractor** to fully comply with the foregoing provisions, such claims shall be deemed waived and no right to recover on such claims shall exist. Damages that the **Contractor** may claim in any action or dispute resolution procedure arising under or by reason of this **Contract** shall not be different from or in excess of the statements and documentation made pursuant to this article.

30.2 In addition to the foregoing statements, the Contractor shall, upon notice from the Commissioner, produce for examination at the Contractor's office, by the Engineer, Architect or Project Manager, all of its books of account, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this Contract, and submit itself and persons in its employment, for examination under oath by any person designated by the Commissioner or Comptroller to investigate claims made or disputes against the City under this Contract. At such examination, a duly authorized representative of the Contractor may be present.

30.3 In addition to the statements required under Article 28 and this Article, the Contractor and/or its Subcontractor shall, within thirty (30) Days upon notice from the Commissioner or Comptroller, produce for examination at the Contractor's and/or Subcontractor's office, by a representative of either the Commissioner or Comptroller, all of its books of account, bid documents, financial statements, accountant workpapers, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this Contract. Further, the Contractor and/or its Subcontractor shall submit any person in its employment, for examination under oath by any person designated by the Commissioner or Comptroller to investigate claims made or disputes against the City under this Contract. At such examination, a duly authorized representative of the Contractor may be present.

30.4 Unless the information and examination required under Article 30.3 is provided by the Contractor and/or its Subcontractor upon thirty (30) Days notice from the Commissioner or Comptroller, or upon the Commissioner's or Comptroller's written authorization to extend the time to comply, the City shall be released from all claims arising under, relating to or by reason of this Contract, except for sums certified by the Commissioner or Comptroller to be due under the provisions of this Contract. It is further stipulated and agreed that no person has the power to waive any of the foregoing provisions and that in any action or dispute resolution procedure against the City to recover any sum in excess of the sums certified by the Commissioner or Comptroller to be due under or by reason of this Contract, the Contractor must allege in its complaint and prove, at trial or during such dispute resolution procedure, compliance with the provisions of this Article.

30.5 In addition, after the commencement of any action or dispute resolution procedure by the Contractor arising under or by reason of this Contract, the City shall have the right to require the Contractor to produce for examination under oath, up until the trial of the action or hearing before the Contract Dispute Resolution Board, the books and documents described in Article 30.3 and submit itself and all persons in its employ for examination under oath. If this Article is not complied with as required, then the Contractor hereby consents to the dismissal of the action or dispute resolution procedure.

CHAPTER VII POWERS OF THE RESIDENT ENGINEER, THE ENGINEER OR ARCHITECT AND THE COMMISSIONER

ARTICLE 31. THE RESIDENT ENGINEER

31.1 The Resident Engineer shall have the power to inspect, supervise and control the performance of the Work, subject to review by the Commissioner. The Resident Engineer shall not, however, have the power to issue an Extra Work order, except as specifically designated in writing by the Commissioner.

ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER

32.1 The **Engineer or Architect or Project Manager**, in addition to those matters elsewhere herein delegated to the **Engineer** and expressly made subject to his/her determination, direction or approval, shall have the power, subject to review by the **Commissioner**:

32.1.1 To determine the amount, quality, and location of the **Work** to be paid for hereunder; and

32.1.2 To determine all questions in relation to the **Work**, to interpret the **Contract Drawings, Specifications, and Addenda**, and to resolve all patent inconsistencies or ambiguities therein; and

32.1.3 To determine how the **Work** of this **Contract** shall be coordinated with **Work** of other **Contractors** engaged simultaneously on this **Project**, including the power to suspend any part of the **Work**, but not the whole thereof; and

32.1.4 To make minor changes in the **Work** as he/she deems necessary, provided such changes do not result in a net change in the cost to the **City** or to the **Contractor** of the **Work** to be done under the **Contract**; and

32.1.5 To amplify the **Contract Drawings**, add explanatory information and furnish additional **Specifications** and drawings, consistent with this **Contract**.

32.2 The foregoing enumeration shall not imply any limitation upon the power of the **Engineer or Architect or Project Manager**, for it is the intent of this **Contract** that all of the **Work** shall generally be subject to his/her determination, direction and approval, except where the determination, direction or approval of someone other than the **Engineer or Architect or Project Manager** is expressly called for herein.

32.3 The **Engineer or Architect or Project Manager** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

ARTICLE 33. THE COMMISSIONER

33.1 The **Commissioner**, in addition to those matters elsewhere herein expressly made subject to his/her determination, direction or approval, shall have the power:

33.1.1 To review and make determinations on any and all questions in relation to this **Contract** and its performance; and

33.1.2 To modify or change this **Contract** so as to require the performance of **Extra Work** (subject, however, to the limitations specified in Article 25) or the omission of **Contract Work**; and

33.1.3 To suspend the whole or any part of the **Work** whenever in his/her judgment such suspension is required:

33.1.3(a) In the interest of the **City** generally; or

33.1.3(b) To coordinate the **Work** of the various **Contractors** engaged on this **Project** to the provisions of Article 12; or

33.1.3(c) To expedite the completion of the entire **Project** even though the completion of this particular **Contract** may thereby be delayed.

ARTICLE 34. NO ESTOPPEL

34.1 Neither the City nor any Agency, officer, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this Contract by the City, the Commissioner, the Resident Engineer, or any other officer, agent or employee of the City, either before or after the final completion and acceptance of the Work and payment therefor:

34.1.1 From showing the true and correct classification, amount, quality or character of the Work actually done; or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the Work, or any part thereof, does not in fact conform to the requirements of this Contract; and

34.1.2 From demanding and recovering from the Contractor any overpayment made to it, or such damages as the City may sustain by reason of the Contractor's failure to perform each and every part of its Contract.

CHAPTER VIII LABOR PROVISIONS

ARTICLE 35. EMPLOYEES

35.1 The Contractor and its Subcontractors shall not employ on the Work:

35.1.1 Anyone who is not competent, faithful and skilled in the Work for which he/she shall be employed; and whenever the Commissioner shall inform the Contractor, in writing, that any employee is, in his/her opinion, incompetent, unfaithful or disobedient, that employee shall be discharged from the Work forthwith, and shall not again be employed upon it; or

35.1.2 Any labor, materials or means whose employment, or utilization during the course of this Contract, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of Work or similar troubles by workers employed by the Contractor or its Subcontractors, or by any of the trades working in or about the buildings and premises where Work is being performed under this Contract, or by Other Contractors or their Subcontractors pursuant to other Contracts, or on any other building or premises owned or operated by the City, its Agencies, departments, boards or authorities. Any violation by the Contractor of this requirement may, upon certification of the Commissioner, be considered as proper and sufficient cause for declaring the Contractor to be in default, and for the City to take action against it as set forth in Chapter X of this Contract, or such other article of this Contract as the Commissioner may deem proper; or

35.1.3 In accordance with Section 220.3-e of the Labor Law of the State of New York (hereinafter "Labor Law"), the Contractor and its Subcontractors shall not employ on the Work any apprentice, unless he/she is a registered individual, under a bona fide program registered with the New York State Department of Labor. The allowable ratio of apprentices to journey-level workers in any craft classification shall not be greater than the ratio permitted to the Contractor as to its Work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the Comptroller of the City for the classification of Work actually performed. The Contractor or Subcontractor will be required to furnish written evidence of the registration of its program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the Contract Work.

35.2 If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand dollars, all laborers, workers, and mechanics employed in the performance of the **Contract** on the public work site, either by the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States department of labor's occupational safety and health administration that is at least ten hours in duration.

ARTICLE 36. NO DISCRIMINATION

36.1 The **Contractor** specifically agrees, as required by Labor Law Section 220-e, as amended, that:

36.1.1 In the hiring of employees for the performance of **Work** under this **Contract** or any subcontract hereunder, neither the **Contractor**, **Subcontractor**, nor any person acting on behalf of such **Contractor** or **Subcontractor**, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the **Work** to which the employment relates;

36.1.2 Neither the **Contractor**, **Subcontractor**, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this **Contract** on account of race, creed, color or national origin;

36.1.3 There may be deducted from the amount payable to the **Contractor** by the **City** under this **Contract** a penalty of fifty (\$50.00) dollars for each person for each **Day** during which such person was discriminated against or intimidated in violation of the provisions of this **Contract**; and

36.1.4 This **Contract** may be cancelled or terminated by the **City** and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this article.

36.1.5 The aforesaid provisions of this article covering every **Contract** for or on behalf of the State or a municipality for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

36.2 The **Contractor** specifically agrees, as required by Section 6-108 of the Administrative Code, as amended, that:

36.2.1 It shall be unlawful for any person engaged in the construction, alteration or repair of buildings or engaged in the construction or repair of streets or highways pursuant to a **Contract** with the **City** or engaged in the manufacture, sale or distribution of materials, equipment or supplies pursuant to a **Contract** with the **City** to refuse to employ or to refuse to continue in any employment any person on account of the race, color or creed of such person.

36.2.2 It shall be unlawful for any person or any servant, agent or employee of any person, described in Article 36.1.2, to ask, indicate or transmit, orally or in writing, directly or indirectly, the race, color or creed or religious affiliation of any person employed or seeking employment from such person, firm or corporation.

36.2.3 Breach of the foregoing provisions shall be deemed a violation of a material provision of this **Contract**.

36.2.4 Any person, or the employee, manager or owner of or officer of such firm or corporation who shall violate any of the provisions of this section shall, upon conviction thereof, be punished by

a fine of not more than one hundred (\$100.00) dollars or by imprisonment for not more than thirty (30) Days, or both.

36.3 This **Contract** is subject to the requirements of Executive Order No. 50 (1980) ("E.O. 50"), as revised, and the Rules and Regulations promulgated thereunder. No **Contract** will be awarded unless and until these requirements have been complied with in their entirety. By signing this **Contract**, the **Contractor** agrees that it:

36.3.1 Will not engage in any unlawful discrimination against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, rates of pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment; and

36.3.2 Will not engage in any unlawful discrimination in the selection of **Subcontractors** on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation; and

36.3.3 Will state in all solicitations or advertisements for employees placed by or on behalf of the **Contractor** that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, citizens status, disability, marital status, sexual orientation, or that it is an equal employment opportunity employer; and

36.3.4 Will send to each labor organization or representative of workers with which it has a Collective Bargaining Agreement or other **Contract** or memorandum of understanding, written notification of its equal employment opportunity commitments under E.O. 50 and the Rules and Regulations promulgated thereunder; and

36.3.5 Will furnish all information and reports including an Employment Report before the award of the **Contract** which are required by E.O. 50, the Rules and Regulations promulgated thereunder, and orders of the Department of Business Services, Division of Labor Services ("DLS") and will permit access to its books, records and accounts by the DLS for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

36.4 The **Contractor** understands that in the event of its noncompliance with the nondiscrimination clauses of this **Contract** or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of this **Contract** and noncompliance with E.O. 50 and the Rules and Regulations promulgated thereunder. After a hearing held pursuant to the rules of the DLS, the Director of the DLS may direct the **Commissioner** to impose any or all of the following sanctions:

36.4.1 Disapproval of the **Contractor**; and/or

36.4.2 Suspension or termination of the **Contract**; and/or

36.4.3 Declaring the **Contractor** in default; and/or

36.4.4 In lieu of any of the foregoing sanctions, the Director of the DLS may impose an employment program.

Failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in the **Agency** declaring the **Contractor** to be non-responsible.

The **Contractor** further agrees that it will refrain from entering into any **Contract** or **Contract** modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a **Subcontractor** who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder.

36.5 The **Contractor** specifically agrees, as required by Section 6-123 of the Administrative Code, that:

36.5.1 The **Contractor** will not engage in any unlawful discriminatory practice in violation of Title VIII of the Administrative Code;

36.5.2 every agreement between the **Contractor** and its **Subcontractors** in excess of \$50,000 shall include a provision that the **Subcontractor** shall not engage in any unlawful discriminatory practice as defined in title viii of the Administrative Code (Section 8-101 et. seq.); and

36.5.3 Any failure to comply with this Article 36.5 may subject the **Contractor** to the remedies set forth in Section 6-123 of the Administrative Code, including, where appropriate, sanctions such as withholding of payment, imposition of an employment program, finding the **Contractor** to be in default, cancellation of the **Contract**, or any other sanction or remedy provided by Law or **Contract**.

ARTICLE 37. LABOR LAW REQUIREMENTS

37.1 The **Contractor** shall strictly comply with all applicable provisions of the Labor Law, as amended. Such compliance is a material term of this **Contract**.

37.2 The **Contractor** specifically agrees, as required by Labor Law Section 220 and 220-d, as amended, that:

37.2.1 **Hours of Work:** No laborer, worker, or mechanic in the employ of the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by this **Contract** shall be permitted or required to work more than eight (8) hours in any one (1) calendar **Day**, or more than five (5) **Days** in any one (1) week, except as provided in the Labor Law and in cases of extraordinary emergency including fire, flood, or danger to life or property, or in the case of national emergency when so proclaimed by the President of the United States of America.

37.2.2 In situations in which there are not sufficient laborers, workers and mechanics who may be employed to carry on expeditiously the **Work** contemplated by this **Contract** as a result of such restrictions upon the number of hours and days of labor, and the immediate commencement or prosecution or completion without undue delay of the **Work** is necessary for the preservation of the **Site** and/or for the protection of the life and limb of the persons using the same, such laborers, workers, and mechanics shall be permitted or required to work more than eight (8) hours in any one (1) **Day**; or five (5) **Days** in any one (1) week; provided, however, that upon application of any **Contractor**, the **Commissioner** shall have first certified to the Commissioner of Labor of the State of New York (hereinafter "**Commissioner of Labor**") that such public **Work** is of an important nature and that a delay in carrying it to completion would result in serious disadvantage to the public; and provided, further, that such **Commissioner of Labor** shall have determined that such an emergency does in fact exist as provided in Labor Law Section 220.2.

37.2.3 Failure of the **Commissioner** to make such a certification to the Commissioner of Labor shall not entitle the **Contractor** to damages for delay or for any cause whatsoever.

37.2.4 Prevailing Rate of Wages: The wages to be paid for a legal day's Work to laborers, workers, or mechanics employed upon the Work contemplated by this Contract or upon any materials to be used thereon shall not be less than the "prevailing rate of wage" as defined in Labor Law Section 220, and as fixed by the Comptroller in the attached Schedule of Wage Rates and in updated schedules thereof. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the Work is being performed.

37.2.5 Requests for interpretation or correction in the Information for Bidders includes all requests for clarification of the classification of trades to be employed in the performance of the Work under this Contract. In the event that a trade not listed in the Contract is in fact employed during the performance of this Contract, the Contractor shall be required to obtain from the Agency the prevailing wage rates and supplementary benefits for the trades used and to complete the performance of this Contract at the price at which the Contract was awarded.

37.2.6 Minimum Wages: Except for employees whose wage is required to be fixed pursuant to Labor Law Section 220, all persons employed by the Contractor and any Subcontractor in the manufacture or furnishing of the supplies, materials, or equipment, or the furnishing of work, labor, or services, used in the performance of this Contract, shall be paid, without subsequent deduction or rebate unless expressly authorized by Law, not less than the sum mandated by Law. Minimum wages shall be the rates fixed by Federal Law and regulations.

37.3 Working Conditions: No part of the Work, labor or services shall be performed or rendered by the Contractor in any plants, factories, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of this Contract. Compliance with the safety, sanitary and factory inspection Laws of the state in which the Work is to be performed shall be prima facie evidence of compliance with this article.

37.4 Prevailing Wage Enforcement: The Contractor agrees to pay for all costs incurred by the City in enforcing prevailing wage requirements, including the cost of any investigation conducted by or on behalf of the Agency or the Comptroller, where the City discovers a failure to comply with any of the requirements of this Article 37 by the Contractor or its Subcontractor(s). The Contractor also agrees, that should it fail or refuse to pay for any such investigation, the Agency is hereby authorized to deduct from a Contractor's account an amount equal to the cost of such investigation.

37.4.1 The Labor Law Section 220 and Section 220-d, as amended, provide that this Contract shall be forfeited and no sum paid for any Work done hereunder on a second conviction for willfully paying less than:

37.4.1(a) The stipulated wage scale as provided in Labor Law Section 220, as amended, or

37.4.1(b) Less than the stipulated minimum hourly wage scale as provided in Labor Law Section 220-d, as amended.

37.4.2 For any breach or violation of either Working Conditions (Article 37.3) and Minimum Wages (Article 37.2.6), the party responsible therefore shall be liable to the City for liquidated damages, which may be withheld from any amounts due on any Contracts with the City of such party responsible, or may be recovered in suits brought by the Corporation Counsel in the name of the City, in addition to damage for any other breach of this Contract, a sum equal to the amount of any underpayment of wages due to any employee engaged in the performance of this Contract. In addition, the Commissioner shall have the right to cancel Contracts and enter into other Contracts for the completion of the original Contract, with or without public letting, and the original Contractor shall be liable for any additional cost. All sums withheld or recovered as deductions, rebates, refunds, or underpayment of wages hereunder, shall be held in a special deposit account and

shall be paid without interest, on order of the **Comptroller**, directly to the employees who have been paid less than minimum rates of pay as set forth herein and on whose account such sums were withheld or recovered, provided that no claims by employees for such payments shall be entertained unless made within two (2) years from the date of actual notice to the **Contractor** of the withholding or recovery of such sums by the **City**.

37.4.3 A determination by the **Comptroller** that a **Contractor** and/or its **Subcontractor** willfully violated Labor Law Section 220 will be forwarded to the **City's** five District Attorneys for review.

37.4.4 The **Contractor's** or **Subcontractor's** noncompliance with this article and Labor Law Section 220, may result in an unsatisfactory performance evaluation and the **Comptroller** may also find and determine that the **Contractor** or **Subcontractor** willfully violated the New York Labor Law.

37.4.4(a) An unsatisfactory performance evaluation for noncompliance with this article may result in a determination that the **Contractor** is a non-responsible bidder on subsequent procurements with the **City** and thus a rejection of a future award of a contract with the **City**, as well as any other sanctions provided for by Law.

37.4.4(b) Labor Law Section 220-b, as amended, provides that when two (2) final determinations have been rendered against a **Contractor** or **Subcontractor** within any consecutive six (6) year period determining that such **Contractor** or **Subcontractor** has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with the Labor Law and this article, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public work projects are rendered simultaneously, such **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public work contract with the **City** for a period of five (5) years from the second final determination. If the final determination involves the falsification of payroll records or the kickback of wages or supplements, the **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public work contract with the **City** for a period of five (5) years from the first final determination.

37.4.4(c) Labor Law Section 220, as amended, provides that the **Contractor** or **Subcontractor** found to have violated this article may be directed to make payment of wages or supplements including interest found to be due, and the **Contractor** or **Subcontractor** may be directed to make payment of a further sum as a civil penalty in an amount not exceeding twenty-five (25%) percent of the total amount found to be due.

37.5 The **Contractor** and its **Subcontractors** shall within ten (10) Days after mailing of a Notice of Award or written order, post in prominent and conspicuous places in each and every plant, factory, building, and structure where employees of the **Contractor** and its **Subcontractors** engaged in the performance of this **Contract** are employed, notices furnished by the **City**, in relation to prevailing wages and supplements, minimum wages and other stipulations contained in Sections 220 and 220-h of the Labor Law, and the **Contractor** and its **Subcontractors** shall continue to keep such notices posted in such prominent and conspicuous places until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services required to be furnished or rendered under this **Contract**.

37.6 The **Contractor** shall strictly comply with all of the provisions of Articles 37.6.1 through 37.6.5, and provide for all workers, laborers or mechanics in its employ, the following:

37.6.1 Notices Posted At Site: Post, in a location designated by the **City**, schedules of prevailing wages and supplements for this **Project**, a copy of all re-determinations of such schedules for the

Project, the Workers' Compensation Law Section 51 notice, all other notices required by law to be posted at the **Site**, the City notice that this **Project** is a public works **Project** on which each worker is entitled to receive the prevailing wages and supplements for the occupation at which he or she is working, and all other notices which the City directs the **Contractor** to post. The **Contractor** shall provide a surface for such notices which is satisfactory to the City. The **Contractor** shall maintain and keep current such notices in a legible manner and shall replace any notice or schedule which is damaged, defaced, illegible or removed for any reason. The **Contractor** shall post such notices before commencing any **Work** on the **Site** and shall maintain such notices until all **Work** on the **Site** is complete; and

37.6.2 Daily Site Sign-in Sheets: Maintain daily **Site** sign-in sheets, and require that **Subcontractors** maintain daily **Site** sign-in sheets for its employees, which include blank spaces for an employee's name to be both printed and signed, job title, date started and Social Security number, the time the employee began **Work** and the time the employee left **Work**, until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services to be furnished or rendered under this **Contract** unless exception is granted by the Comptroller upon application by the **Agency**. In the alternative, subject to the approval of the CCPO, the **Contractor** and **Subcontractor** may maintain an electronic or biometric sign-in system, which provides the information required by this Article 37.6.2; and

37.6.3 Individual Employee Information Notices: Distribute a notice, to each worker, laborer or mechanic employed under this **Contract**, in a form provided by the **Agency**, that this **Project** is a public work project on which each worker, laborer or mechanic is entitled to receive the prevailing rate of wages and supplements for the occupation at which he or she is working. If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand dollars, such notice shall also include a statement that, that each worker, laborer or mechanic be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States department of labor's occupational safety and health administration that is at least ten hours in duration. Such notice shall be distributed to each worker before he or she starts performing any **Work** of this **Contract** and with the first paycheck after July first of each year. Worker, laborer or mechanic includes employees of the **Contractor** and all **Subcontractors** and all employees of suppliers entering the **Site**. At the time of distribution, the **Contractor** shall have each worker, laborer or mechanic sign a statement, in a form provided by the **Agency**, certifying that the worker has received the notice required by this article, which signed statement shall be maintained with the payroll records required by this **Contract**; and

37.6.3.1 The **Contractor** and each **Subcontractor** shall notify each worker, laborer or mechanic employed under this **Contract** in writing of the prevailing rate of wages for their particular job classification. Such notification shall be given to every worker, laborer and mechanic on their first pay stub and with every pay stub thereafter; and

37.6.4 Site Laminated Identification Badges: Provide laminated identification badges which indicate the worker's, laborer's or mechanic's name, trade, employer's name and employment starting date (month/day/year). Further, require as a condition of employment on the **Site**, that each and every worker, laborer or mechanic wear the laminated identification badge at all times and that it may be seen by any representative of the City; and

37.6.5 Language Other Than English Used On Site: Provide the ACCO notice when three (3) or more employees (worker and/or laborer and/or mechanic) on the **Site**, at any time, speak a language other than English. The ACCO will then provide the **Contractor** the notices in Article 37.6.1 in that language or languages as may be required. The **Contractor** is responsible for all distributions under Article 37; and

37.6.6 Provision of Records: The Contractor and Subcontractor(s) shall produce within five (5) Days on the Site of the Work and upon a written order of the Engineer, the Commissioner, the ACCO, the Agency EAO, or the Comptroller, such records as are required to be kept by this Article 37.6; and

37.6.7 If this Contract is for an amount greater than \$1,000,000, checks issued by the Contractor to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the Agency). For any subcontract for an amount greater than \$750,000, checks issued by a Subcontractor to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the Agency); and

37.6.8 The failure of the Contractor or Subcontractor(s) to comply with the provisions of Articles 37.6.1 through 37.6.7 may result in the Commissioner declaring the Contractor or Subcontractor(s) in default and/or the withholding of payments otherwise due under the Contract.

37.7 The Contractor and its Subcontractors shall keep such employment and payroll records as are required by Section 220 of the Labor Law.

37.8 At the time the Contractor makes application for each partial payment and for final payment, the Contractor shall submit to the Commissioner a written payroll certification, in the form provided by this Contract, of compliance with the prevailing wage, minimum wage and other provisions and stipulations required by Labor Law Section 220 and of compliance with the training requirements of Labor law section 220-h set forth in Article 35.2. This certification of compliance with the provisions of this article shall be a condition precedent to payment and no payment shall be made to the Contractor unless and until each such certification shall have been submitted to and received by the Commissioner.

37.9 This Contract is executed by the Contractor with the express warranty and representation that the Contractor is not disqualified under the provisions of Section 220 of the Labor Law for the award of the Contract.

37.10 Any breach or violation of any of the foregoing shall be deemed a breach or violation of a material provision of this Contract, and grounds for cancellation thereof by the City.

ARTICLE 38. PAYROLL REPORTS

38.1 The Contractor shall maintain on the Site the original payrolls or transcripts thereof which the Contractor and its Subcontractor(s) are required to maintain pursuant to Labor Law Section 220. The Contractor and Subcontractor(s) shall submit original payrolls or transcripts, subscribed and affirmed by it as true, with each and every payment requisition. The Contractor and Subcontractor(s) shall produce within five (5) Days on the Site of the Work and upon a written order of the Engineer, the Commissioner, the ACCO, the Agency EAO, or the Comptroller, such original payrolls or transcripts thereof, subscribed and affirmed by it as true, and the statements signed by each worker pursuant to this Chapter VIII. In addition, the Contractor and Subcontractor(s) shall furnish to the Engineer upon written demand any other information to satisfy the Engineer that this Chapter VIII and the Labor Law, as to the hours of employment and rates of wages, are being observed. The Contractor shall maintain the payrolls or transcripts thereof for six (6) years from the date of completion of the Work on this Contract.

38.2 When directed by the Engineer, the Contractor or Subcontractor shall provide the Engineer with an attendance sheet for each Day on which Work is performed on the Site. Such attendance sheet shall be in a form acceptable to the Agency and shall provide information for employees of the Contractor and Subcontractor(s).

ARTICLE 39. DUST HAZARDS

39.1 Should a harmful dust hazard be created in performing the Work of this Contract, for the elimination of which appliances or methods have been approved by the Board of Standards and Appeals of the City of New York, such appliances and methods shall be installed, maintained, and effectively operated during the continuance of such harmful dust hazard. Failure to comply with this provision after notice shall make this Contract void.

CHAPTER IX

PARTIAL AND FINAL PAYMENTS

ARTICLE 40. CONTRACT PRICE

40.1 The City shall pay, and the Contractor agrees to accept, in full consideration for the Contractor's performance of the Work subject to the terms and conditions hereof, the lump sum price or unit prices which this Contract was awarded, plus the amount required to be paid for any Extra Work ordered by the Commissioner under Article 25, less credit for any Work omitted pursuant to Article 29.

ARTICLE 41. BID BREAKDOWN ON LUMP SUM

41.1 Within fifteen (15) Days after the commencement date specified in the Notice to Proceed, unless otherwise directed by the Resident Engineer, the Contractor shall submit to the Resident Engineer a breakdown of its bid price, or of lump sums bid for items of the Contract, showing the various operations to be performed under the Contract, as directed in the progress schedule required under Article 9, and the value of each of such operations, the total of such items to equal the lump sum price bid. Said breakdown must be approved in writing by the Resident Engineer.

41.2 No partial payment will be approved until the Contractor submits a bid breakdown that is acceptable to the Resident Engineer.

41.3 The Contractor shall also submit such other information relating to the bid breakdown as directed by the Resident Engineer. Thereafter, the breakdown may be used only for checking the Contractor's applications for partial payments hereunder, but shall not be binding upon the City, the Commissioner, or the Engineer for any purpose whatsoever.

ARTICLE 42. PARTIAL PAYMENTS

42.1 From time to time as the Work progresses satisfactorily, but not more often than once a month, the Contractor may submit to the Engineer a requisition for a partial payment in the prescribed form, which shall contain an estimate of the quantity and the fair value of the Work done during the payment period.

42.2 Partial payments may be made for materials, fixtures and equipment in advance of their actual incorporation in the Work, as the Commissioner may approve, and upon the terms and conditions set forth in the General Conditions.

42.3 The Contractor shall also submit to the Commissioner in connection with every application for partial payment a verified statement in the form prescribed by the Comptroller setting forth the information required under Labor Law Section 220-a.

42.4 Within thirty (30) Days after receipt of such satisfactory payment application, the Engineer will prepare and certify, and the Commissioner will approve, a voucher for a partial payment in the amount of such approved estimate, less any and all deductions authorized to be made by the Commissioner under the terms of this Contract or by Law.

ARTICLE 43. PROMPT PAYMENT

43.1 The Prompt Payment provisions of the PPB Rules in effect at the time of the Bid will be applicable to payments made under this Contract. The provisions require the payment to Contractor of interest on payments made after the required payment date, except as set forth in the PPB Rules.

43.2 The Contractor shall submit a proper invoice to receive payment, except where the Contract provides that the Contractor will be paid at predetermined intervals without having to submit an invoice for each scheduled payment.

43.3 Determination of interest due will be made in accordance with the PPB Rules.

43.4 If the Contractor is paid interest, the proportionate share of that interest shall be forwarded by the Contractor to its Subcontractor(s).

43.5 The Contractor shall pay each Subcontractor or Materialman not later than seven (7) Days after receipt of payment out of amounts paid to the Contractor by the City for Work performed by the Subcontractor or Materialman under this Contract.

43.5.1 If Contractor fails to make any payment to any Subcontractor or Materialman within seven (7) days after receipt of payment by the City pursuant to section 43.5 herein, then the Contractor shall pay interest on amounts due to such Subcontractor or Materialman at a rate of interest in effect on the date such payment is made by the Contractor computed in accordance with section 756-b (1)(b) of the NY General Business Law. Accrual of interest shall commence on the day immediately following the expiration of the seventh day following receipt of payment to the Contractor by the City and shall end on the date on which payment is made.

43.6 The Contractor shall include in each of its subcontracts a provision requiring each Subcontractor to make payment to each of its Subcontractors or suppliers for Work performed under this Contract in the same manner and within the same time period set forth above.

ARTICLE 44. SUBSTANTIAL COMPLETION PAYMENT

44.1 When the Work in the opinion of the Commissioner, has been substantially but not entirely completed, he/she shall issue a certificate of Substantial Completion.

44.2 The Contractor shall submit with the Substantial Completion requisition:

44.2.1 A Final Verified Statement of any and all alleged claims against the City and any pending dispute resolution procedures in accord with the PPB Rules and this Contract, in any way connected with or arising out of this Contract (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the Contractor claims the performance of the Work or a particular

part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay.

44.2.1(a) With respect to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the Corporation Counsel of the **City** shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this article is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor** upon acceptance of the **Substantial Completion** payment pursuant to this article, will have waived any such claims.

44.2.2 A Final Approved Punch List.

44.2.3 Where required, a request for a substantial or final extension of time.

44.3 The **Commissioner** shall issue a voucher calling for payment of any part or all of the balance due for **Work** performed under the **Contract**, including monies retained under Article 21, less any and all deductions authorized to be made by the **Commissioner**, under this **Contract** or by Law, and less twice the amount the **Commissioner** considers necessary to ensure the completion of the balance of the **Work** by the **Contractor**. Such a payment shall be considered a Partial and not a Final Payment. No **Substantial Completion** payment shall be made under this article where the **Contractor** shall fail to complete the **Work** within the time fixed for such completion in the Schedule A of the General Conditions, or within the time to which completion may have been extended, until an extension or extensions of time for the completion of **Work** have been acted upon pursuant to Article 13.

44.4 No further partial payments shall be made to the **Contractor** after the **Commissioner** issues a Certificate of **Substantial Completion**, except the **Substantial Completion** payment and **Contractor's** requisition that were properly filed with the **Commissioner** prior to the date of **Substantial Completion**; however, the **Commissioner** may grant a waiver for further partial payments after the date of **Substantial Completion** to permit payments for change order **Work** and/or release of retainage and deposits pursuant to Articles 21 and 24. Such waiver shall be in writing.

44.5 The **Contractor** acknowledges that nothing contained in this article is intended to or shall in any way diminish the force and effect of Article 13.

ARTICLE 45. FINAL PAYMENT

45.1 After completion and **Final Acceptance** of the **Work**, the **Contractor** shall submit all required certificates and documents, together with a requisition for the balance claimed to be due under the **Contract**, less the amount authorized to be retained for maintenance under Article 24. A verified statement similar to that required in connection with applications for partial payments shall also be submitted to the **Commissioner**.

45.2 Amended Verified Statement of Claims: The **Contractor** shall also submit with the final requisition any amendments to the final verified statement of any and all alleged claims against the **City**, and any pending dispute resolution procedures in accord with the PPB Rules and this **Contract**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30.) that have occurred subsequent to **Substantial Completion**, setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each such item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the **Contractor** claims the performance of the **Work** or a particular part thereof was

delayed, and an itemized statement and breakdown of the amount claimed for each such delay. With reference to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the Corporation Counsel of the **City** shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this article, is entitled to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor**, upon acceptance of the Final Payment pursuant to Article 46, will have waived any such claims.

45.3 Preparation of Final Voucher: Upon determining the balance due hereunder other than on account of claims, the **Engineer** will prepare and certify, for the **Commissioner's** approval, a voucher for final payment in that amount less any and all deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**. In the case of a lump sum **Contract**, the **Commissioner** shall certify the voucher for final payment within thirty (30) Days from the date of completion and acceptance of the **Work**, provided all requests for extensions of time have been acted upon.

45.3.1 All prior certificates and vouchers upon which partial payments were made, being merely estimates made to enable the **Contractor** to prosecute the **Work** more advantageously, shall be subject to correction in the final voucher, and the certification of the **Engineer** thereon and the approval of the **Commissioner** thereof, shall be conditions precedent to the right of the **Contractor** to receive any money hereunder. Such final voucher shall be binding and conclusive upon the **Contractor**.

45.3.2 Payment pursuant to such final voucher, less any deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**, shall constitute the final payment, and shall be made by the **Comptroller** within thirty (30) Days after the filing of such voucher in his/her office.

45.4 The **Contractor** acknowledges that nothing contained in this article is intended to or shall in any way diminish the force and effect of Article 13.

ARTICLE 46. ACCEPTANCE OF FINAL PAYMENT

46.1 The acceptance by the **Contractor**, or by anyone claiming by or through it, of the final payment, whether such payment be made pursuant to any judgment of any Court, or otherwise, shall constitute and operate as a release to the **City** from any and all claims of and liability to the **Contractor** for anything heretofore done or furnished for the **Contractor** relating to or arising out of this **Contract** and the **Work** done hereunder, and for any prior act, neglect or default on the part of the **City** or any of its officers, agents or employees, excepting only a claim against the **City** for the amounts deducted or retained in accordance with the terms and provisions of this **Contract** or by **Law**, and excepting any claims, not otherwise waived, or any pending dispute resolution procedures which are contained in the verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44 and 45.

46.2 The **Contractor** is warned that the execution by it of a release, in connection with the acceptance of the final payment, containing language purporting to reserve claims other than those herein specifically excepted from the operation of this article, or those for amounts deducted by the **Commissioner** from the final requisition or by the **Comptroller** from the final payment as certified by the **Engineer** and approved by the **Commissioner**, shall not be effective to reserve such claims, anything stated to the **Contractor** orally or in writing by any officer, agent or employee of the **City** to the contrary notwithstanding.

46.3 Should the **Contractor** refuse to accept the final payment as tendered by the **Comptroller**, it shall constitute a waiver of any right to interest thereon.

46.4 The Contractor, however, shall not be barred from commencing an action for breach of Contract under this provision to the extent permitted by Law and by the terms of the Contract provided that a detailed and verified statement of claim is served upon the contracting Agency and Comptroller not later than forty (40) Days after the mailing of such final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION

47.1 All works of art, including paintings, mural decorations, stained glass, statues, bas-reliefs and other sculptures, monuments, fountains, arches, and other structures of a permanent character intended for ornament or commemoration, and every design of the same to be used in the performance of this Contract, and the design of all bridges, approaches, buildings, gates, fences, lamps, or structures to be erected, pursuant to the terms of this Contract, shall be submitted to the Art Commission, d/b/a the Public Design Commission of the City of New York, and shall be approved by the Public Design Commission prior to the erection or placing in the position of the same. The final payment shall not become due or payable under this Contract unless and until the Public Design Commission shall certify that the design for the Work herein contracted for has been approved by the said Public Design Commission, and that the same has been executed in substantial accordance with the design so approved, pursuant to the provisions of Chapter 37, Section 854 of the City Charter, as amended.

CHAPTER X

CONTRACTOR'S DEFAULT

ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT

48.1 In addition to those instances specifically referred to in other Articles herein, the Commissioner shall have the right to declare the Contractor in default of this Contract if:

48.1.1 The Contractor fails to commence Work when notified to do so by the Commissioner; or if

48.1.2 The Contractor shall abandon the Work; or if

48.1.3 The Contractor shall refuse to proceed with the Work when and as directed by the Commissioner; or if

48.1.4 The Contractor shall, without just cause, reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the Commissioner, to complete the Work in accordance with the Progress Schedule; or if

48.1.5 The Contractor shall fail or refuse to increase sufficiently such working force when ordered to do so by the Commissioner; or if

48.1.6 The Contractor shall sublet, assign, transfer, convert or otherwise dispose of this Contract other than as herein specified; or sell or assign a majority interest in the Contractor; or if

48.1.7 The Contractor fails to secure and maintain all required insurance; or if

48.1.8 A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if

48.1.9 The **Commissioner** shall be of the opinion that the **Contractor** is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the **Work**, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

48.1.10 The **Commissioner** shall be of the opinion that the **Contractor** is or has been willfully or in bad faith violating any of the provisions of this **Contract**; or if

48.1.11 The **Commissioner** shall be of the opinion that the **Work** cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the **Commissioner's** opinion, attributable to conditions within the **Contractor's** control; or if

48.1.12 The **Work** is not completed within the time herein provided therefor or within the time to which the **Contractor** may be entitled to have such completion extended; or if

48.1.13 Any statement or representation of the **Contractor** in the **Contract** or in any document submitted by the **Contractor** with respect to the **Work**, the **Project**, or the **Contract** (or for purposes of securing the **Contract**) was untrue or incorrect when made.

48.1.14 The **Contractor** or any of its officers, directors, partners, five (5%) percent shareholders, principals, or other persons substantially involved in its activities, commits any of the acts or omissions specified as the grounds for debarment in the **PPB Rules**.

48.2 Before the **Commissioner** shall exercise his/her right to declare the **Contractor** in default, the **Commissioner** shall give the **Contractor** an opportunity to be heard, upon not less than two (2) **Days** notice.

ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT

49.1 The right to declare in default for any of the grounds specified or referred to in Article 48 shall be exercised by sending the **Contractor** a notice, signed by the **Commissioner**, setting forth the ground or grounds upon which such default is declared (hereinafter referred to as a "Notice of Default").

49.2 The **Commissioner's** determination that the **Contractor** is in default shall be conclusive, final and binding on the parties and such a finding shall preclude the **Contractor** from commencing a plenary action for any damages relating to the **Contract**. If the **Contractor** protests the determination of the **Commissioner**, the **Contractor** may commence a lawsuit in a court of competent jurisdiction of the State of New York under Article 78 of the New York Civil Practice Law and Rules.

ARTICLE 50. QUITTING THE SITE

50.1 Upon receipt of such notice the **Contractor** shall immediately discontinue all further operations under this **Contract** and shall immediately quit the **Site**, leaving untouched all plant, materials, equipment, tools and supplies then on the **Site**.

ARTICLE 51. COMPLETION OF THE WORK

51.1 The **Commissioner**, after declaring the **Contractor** in default, may then have the **Work** completed by such means and in such manner, by **Contract** with or without public letting, or otherwise, as he/she may deem advisable, utilizing for such purpose such of the **Contractor's** plant, materials, equipment, tools and supplies remaining on the **Site**, and also such **Subcontractors**, as he/she may deem advisable.

51.2 After such completion, the **Commissioner** shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and also the total amount of liquidated damages (at the rate provided for in the **Contract**) from the date when the **Work** should have been completed by the **Contractor** in accordance with the terms hereof to the date of actual completion of the **Work**. Such certificate shall be binding and conclusive upon the **Contractor**, its Sureties, and any person claiming under the **Contractor**, as to the amount thereof.

51.3 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, and any liquidated damages assessed against the **Contractor**, shall be charged against and deducted out of monies which are earned by the **Contractor** prior to the date of default. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

ARTICLE 52. PARTIAL DEFAULT

52.1 In case the **Commissioner** shall declare the **Contractor** in default as to a part of the **Work** only, the **Contractor** shall discontinue such part, shall continue performing the remainder of the **Work** in strict conformity with the terms of this **Contract**, and shall in no way hinder or interfere with any **Other Contractor(s)** or persons whom the **Commissioner** may engage to complete the **Work** as to which the **Contractor** was declared in default.

52.2 The provisions of this Chapter relating to declaring the **Contractor** in default as to the entire **Work** shall be equally applicable to a declaration of partial default, except that the **Commissioner** shall be entitled to utilize for completion of the part of the **Work** as to which the **Contractor** was declared in default only such plant, materials, equipment, tools and supplies as had been previously used by the **Contractor** on such part.

ARTICLE 53. PERFORMANCE OF UNCOMPLETED WORK

53.1 In completing the whole or any part of the **Work** under the provision of this Chapter X, the **Commissioner** shall have the power to depart from or change or vary the terms and provisions of this **Contract**, provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the **Commissioner's** certificate of the cost of completion referred to in Article 51, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the **Contractor** hereunder but for its default.

ARTICLE 54. OTHER REMEDIES

54.1 In addition to the right to declare the **Contractor** in default pursuant to this Chapter X, the **Commissioner** shall have the absolute right, in his/her sole discretion and without a hearing, to complete or cause to complete in the same manner as described in Articles 51 and 53, any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the Final Approved Punch List. A written notice of the exercise of this right shall be sent to the **Contractor** who shall immediately quit the **Site** in accordance with the provisions of Article 50.

54.2 The previous provisions of this Chapter X shall be in addition to any and all other legal or equitable remedies permissible in the premises.

54.3 The exercise by the City of any remedy set forth herein shall not be deemed a waiver by the City of any other legal or equitable remedy contained in this **Contract** or provided under Law.

54.4 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, shall be charged against and deducted out of monies which have been earned by the **Contractor** prior to the date of the exercise of the right set forth in Article 54.1; the balance of such monies, if any, subject to the other provisions of this **Contract**, to be paid to the **Contractor** without interest after such completion. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

CHAPTER XI MISCELLANEOUS PROVISIONS

ARTICLE 55. CONTRACTOR'S WARRANTIES

55.1 In consideration of, and to induce, the award of this **Contract** to the **Contractor**, the **Contractor** represents and warrants:

55.1.1 That it is financially solvent, sufficiently experienced and competent to perform the **Work**; and

55.1.2 That the facts stated in its bid and the information given by it pursuant to the **Information for Bidders** is true and correct in all respects; and

55.1.3 That it has read and complied with all requirements set forth in the **Contract**.

ARTICLE 56. CLAIMS AND ACTIONS THEREON

56.1 Any claim, that is not subject to dispute resolution under the **PPB Rules** or this **Contract**, against the **City** for damages for breach of **Contract** shall not be made or asserted in any lawsuit, unless the **Contractor** shall have strictly complied with all requirements relating to the giving of notice and of information with respect to such claims, as herein before provided.

56.2 Nor shall any lawsuit be instituted or maintained on any such claims unless such lawsuit is commenced within six (6) months after the date the **Commissioner** issues a **Certificate of Substantial Completion** pursuant to Article 44; except that:

56.2.1 Any claims arising out of events occurring after the date the **Commissioner** issues a **Certificate of Substantial Completion** and before **Final Acceptance** of the **Work** shall be asserted within six (6) months of **Final Acceptance** of the **Work**;

56.2.2 Any claims for monies deducted, retained or withheld under the provisions of this **Contract** shall be asserted within six (6) months after the date when such monies becomes due and payable hereunder; and

56.2.3 If the **Commissioner** exercises his/her right to terminate the **Contract** pursuant to Article 64, any such lawsuit shall be commenced within six (6) months of the date the **Commissioner** exercises said right.

ARTICLE 57. INFRINGEMENT

57.1 The Contractor shall be solely responsible for and shall indemnify the City against any and all claims and judgments for damages for any infringement of copyright and patents or use of patented articles, tools, materials, equipment, appliances or processes in the performance or completion of the Work, including all costs and expenses which the City shall or may incur or be obligated to pay by reason thereof.

ARTICLE 58. NO CLAIM AGAINST OFFICERS, AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the Contractor against any officer, agent or employee of the City for, or on account of, anything done or omitted to be done in connection with this Contract.

ARTICLE 59. SERVICES OF NOTICES

59.1 The Contractor hereby designates the business address specified in its bid, as the place where all notices, directions or other communications to the Contractor may be delivered, or to which they may be mailed. Actual delivery of any such notice, direction or communication to the aforesaid place, or depositing it in a postpaid wrapper addressed thereto in any post office box (P.O. Box) regularly maintained by the United States Postal Service, shall be conclusively deemed to be sufficient service thereof upon the Contractor as the date of such delivery or deposit.

59.2 Such address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor, and delivered to the Commissioner.

59.3 Nothing herein contained shall, however, be deemed to preclude or render inoperative the service of any notice, direction or other communication upon the Contractor personally, or, if the Contractor is a corporation, upon any officer thereof.

ARTICLE 60. UNLAWFUL PROVISIONS DEEMED STRICKEN FROM CONTRACT

60.1 If this Contract contains any unlawful provision not an essential part of the Contract and which shall not appear to have been a controlling or material inducement to the making thereof, the same shall be deemed of no effect and shall, upon notice by either party, be deemed stricken from the Contract without affecting the binding force of the remainder.

ARTICLE 61. ALL LEGAL PROVISIONS DEEMED INCLUDED

61.1 It is the intent and understanding of the parties to this Contract that each and every provision of Law required to be inserted in this Contract shall be and is inserted herein. Furthermore, it is hereby stipulated that every such provision is to be deemed to be inserted herein, and if, through mistake or otherwise, any such provision is not inserted, or is not inserted in correct form, then this Contract shall forthwith upon the application of either party be amended by such insertion so as to comply strictly with the Law and without prejudice to the rights of either party hereunder.

ARTICLE 62. TAX EXEMPTION

62.1 The City is exempt from payment of Federal, State, local taxes and Sales and Compensation Use Taxes of the State of New York and of cities and counties on all materials and supplies sold to the City pursuant to

the provisions of this **Contract**. These taxes are not to be included in bids. However, this exemption does not apply to tools, machinery, equipment or other property leased by or to the **Contractor** or a **Subcontractor**, or to supplies and materials which even though they are consumed, are not incorporated into the completed **Work** (consumable supplies), and the **Contractor** and its **Subcontractors** shall be responsible for and pay any and all applicable taxes, including Sales and Compensation Use Taxes, on such leased tools, machinery, equipment or other property and upon all such unincorporated supplies and materials.

62.2 The **Contractor** agrees to sell and the **City** agrees to purchase all supplies and materials, other than consumable supplies, required, necessary or proper for or incidental to the construction of the **Project** covered by this **Contract**. The sum paid under this **Contract** for such supplies and materials shall be in full payment and consideration for the sale of such supplies and materials herein.

62.2.1 The **Contractor** agrees to construct the **Project** and to perform all **Work**, labor and services rendered, necessary, proper or incidental thereto for the sum shown in the bid for the performance of such **Work**, labor and services, and the sum so paid pursuant to this **Contract** for such **Work**, labor, etc., shall be in full consideration for the performance by the **Contractor** of all its duties and obligations under this **Contract** in connection with said **Work** and labor.

62.3 The purchase by the **Contractor** of the supplies and materials sold hereunder shall be a purchase or procurement for resale and therefore not subject to the New York State or **City** Sales or Compensation Use Taxes or any such taxes of cities or counties. The sale of such supplies and materials by the **Contractor** to the **City** is exempt from the aforesaid sales or compensating use taxes. With respect to such supplies and materials, the **Contractor**, at the request of the **City**, shall furnish to the **City** such Bills of Sale and other instruments as may be required by the **City**, properly executed, acknowledged and delivered assuring to the **City** title to such supplies and materials, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such materials as the property of the **City**.

62.4 Title to all materials to be sold by the **Contractor** to the **City** pursuant to the provisions of the **Contract** shall immediately vest in and become the sole property of the **City** upon delivery of such supplies and materials to the **Site** and prior to its becoming a part of the permanent structure and/or construction. Notwithstanding such transfer of title, the **Contractor** shall have the full and continuing responsibility to install such materials and supplies in accordance with the provisions of this **Contract**, protect them, maintain them in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional materials in place of any that may be lost, stolen or rendered unusable, without cost to the **City**, until such time as the **Work** covered by the **Contract** is fully accepted by the **City**. Such transfer of title shall in no way affect any of the **Contractor's** obligations hereunder. In the event that, after title has passed to the **City**, any of such supplies and materials are rejected as being defective or otherwise unsatisfactory, title to all such supplies and materials shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** of supplies and materials to be sold hereunder shall also be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid Sales or Compensation Use Taxes, provided that the subcontract agreements provide for the resale of such supplies and materials prior to and separate and apart from the incorporation of such supplies and materials into the permanent structure and/or construction and that such subcontract agreements are in a form similar to this **Contract** with respect to the separation of the sale of materials from the **Work** and labor, services, consumable supplies and any other matters to be provided, and provided further that the subcontract agreements provide separate prices for materials and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for supplies and materials from the payments for other **Work** and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and Materialmen shall obtain any and all necessary **Contractor** Exempt Purchase Certificates or Resale Certificates from the appropriate governmental Agency or

Agencies, and furnish a **Contractor Exempt Purchase Certificate** or **Resale Certificate** to all persons, firms or corporations from which they purchase supplies and materials for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this article shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this article shall control.

ARTICLE 63. INVESTIGATION(S) CLAUSE

63.1 The parties to this **Contract** agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a United States, a State of New York (State) or a City governmental **Agency** or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental **Agency** that is a party in interest to the transaction, submitted bid, submitted proposal, **Contract**, lease, permit or license that is the subject of the investigation, audit or inquiry.

63.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental **Agency** or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, **Contract**, or license entered into with the City, the State, or any political subdivision or public authority thereof, or the Port Authority of New York and New Jersey, or any local development corporation within the City, or any public benefit corporation organized under the Laws of the State of New York, or;

63.3 If any person refuses to testify for a reason other than the assertion of his/her privilege against self incrimination in an investigation, audit or inquiry conducted by a City or State governmental **Agency** or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental **Agency** that is a party in interest in, and is seeking testimony concerning the award of, or performance under any transaction, agreement, lease, permit, **Contract**, or license entered into with the City, the State, or any political subdivision thereof or any local development corporation within the City, then;

63.4 The **Commissioner** whose **Agency** is a party in interest to the transaction, submitted bid, submitted proposal, **Contract**, lease, permit, or license shall convene a hearing, upon not less than five (5) days written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

63.5 If any non-governmental party to the hearing requests an adjournment, the **Commissioner** who convened the hearing may, upon granting the adjournment, suspend any **Contract**, lease, permit, or license, pending the final determination pursuant to Article 63.7 without the City incurring any penalty or damages for delay or otherwise.

63.6 The penalties which may attach after a final determination by the **Commissioner** may include but shall not exceed:

63.6.1 The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any **Contract**, lease, permit or license with or from the City; and/or

63.6.2 The cancellation or termination of any and all such existing **City Contracts**, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted under this **Agreement**, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the **City** incurring any penalty or damages on account of such cancellation or termination; monies lawfully due for goods delivered, **Work** done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the **City**.

63.7 The **Commissioner** shall consider and address in reaching his/her determination and in assessing an appropriate penalty the factors in Articles 63.7.1 and 63.7.2. The **Commissioner** may also consider, if relevant and appropriate, the criteria established in Articles 63.7.3 and 63.7.4, in addition to any other information which may be relevant and appropriate:

63.7.1 The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

63.7.2 The relationship of the person who refused to testify to any entity that is a party to the hearing, including but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility the person has within the entity.

63.7.3 The nexus of the testimony sought to the subject entity and its **Contracts**, leases, permits or licenses with the **City**.

63.7.4 The effect a penalty may have on an unaffiliated and unrelated party or entity that has a significant interest in an entity subject to penalties under Article 63.6, provided that the party or entity has given actual notice to the **Commissioner** upon the acquisition of the interest, or at the hearing called for in Article 63.4, gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity shall present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

63.8 Definitions:

63.8.1 The term "license" or "permit" as used herein shall be defined as a license, permit, franchise or concession not granted as a matter of right.

63.8.2 The term "person" as used herein shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

63.8.3 The term "entity" as used herein shall be defined as any firm, partnership, corporation, association, joint venture, or person that receives monies, benefits, licenses, leases, or permits from or through the **City** or otherwise transacts business with the **City**.

63.8.4 The term "member" as used herein shall be defined as any person associated with another person or entity as a partner, director, officer, principal or employee.

63.9 In addition to and notwithstanding any other provision of this **Contract**, the **Commissioner** may in his/her sole discretion terminate this **Contract** upon not less than three (3) **Days** written notice in the event the

Contractor fails to promptly report in writing to the Commissioner of the Department of Investigations ("DOI") of the City any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the City or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this Contract by the Contractor, or affecting the performance of this Contract.

ARTICLE 64. TERMINATION BY THE CITY

64.1 In addition to termination pursuant to any other article of this Contract, the Commissioner may, at any time, terminate this Contract by written notice to the Contractor. In the event of termination, the Contractor shall, upon receipt of such notice, unless otherwise directed by the Commissioner:

64.1.1 Stop Work on the date specified in the notice;

64.1.2 Take such action as may be necessary for the protection and preservation of the City's materials and property;

64.1.3 Cancel all cancelable orders for material and equipment;

64.1.4 Assign to the City and deliver to the Site or another location designated by the Commissioner, any non-cancelable orders for material and equipment that is not capable of use except in the performance of this Contract and has been specifically fabricated for the sole purpose of this Contract and not incorporated in the Work;

64.1.5 Take no action which will increase the amounts payable by the City under this Contract.

64.2 In the event of termination by the City pursuant to this article, payment to the Contractor shall be in accordance with Articles 64.2.1, 64.2.2 or 64.2.3, to the extent that each respective article applies.

64.2.1 Lump Sum Contracts or Items: On all lump sum Contracts, or on lump sum items in a Contract, the City will pay the Contractor the sum of Articles 64.2.1(a) and 64.2.1(b), less all payments previously made pursuant to this Contract. On lump sum Contracts only, the City will also pay the Contractor an additional sum as provided in 64.2.1(c).

64.2.1(a) For Work completed prior to the notice of termination, the Contractor shall be paid a pro rata portion of the lump sum bid amount, plus approved change orders, based upon the percent completion of the Work, as determined by the Commissioner. For the purpose of determining the pro rata portion of the lump sum bid amount to which the Contractor is entitled, the Bid Breakdown submitted in accordance with Article 41 shall be considered, but shall not be dispositive. The Commissioner's determination hereunder shall be final, binding and conclusive.

64.2.1(b) For non-cancelable material and equipment, less salvage value, that is not capable of use except in the performance of this Contract and has been specifically fabricated for the sole purpose of this Contract, but not yet incorporated in the Work, the Contractor shall be paid the lesser of:

64.2.1(b)(i) The direct cost, as defined in Article 64.2.4; or

64.2.1(b)(ii) The fair and reasonable value, whichever is less, of such material and equipment, plus necessary and reasonable delivery costs.

64.2.1(b)(iii) In addition, the **Contractor** shall be paid five (5%) percent of Article 64.2.1(b)(i) or Article 64.2.1(b)(ii), whichever applies.

64.2.1(c) Except as otherwise provided in Article 64.2.1(d), on all lump sum **Contracts**, the **Contractor** shall be paid the percentage indicated below applied to the difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Articles 64.2.1(a) and 64.2.1(b):

64.2.1(c)(i) Five (5%) percent of the first five million (\$5,000,000.) dollars; and

64.2.1(c)(ii) Three (3%) percent of any amount between five million (\$5,000,000.) dollars and fifteen million (\$15,000,000.) dollars; plus

64.2.1(c)(iii) One (1%) percent of any amount over fifteen million (\$15,000,000.) dollars.

64.2.1(d) In the event the City terminates a lump sum **Contract** pursuant to this article within ninety (90) days after registration of the **Contract** with the **Comptroller**, the **Contractor** shall be paid one (1%) percent of the difference between the lump sum bid amount and the total of all payments made pursuant to this article.

64.2.2 Unit Price **Contracts** or Items: On all unit price **Contracts**, or on unit price items in a **Contract**, the City will pay the **Contractor** the sum of Articles 64.2.2(a) and 64.2.2(b), less all payments previously made pursuant to this **Contract**:

64.2.2(a) For all completed units, the unit price stated in the **Contract**, and

64.2.2(b) For units that have been ordered but are only partially completed, the **Contractor** will be paid:

64.2.2(b)(i) A pro rata portion of the unit price stated in the **Contract** based upon the percent completion of the unit and

64.2.2(b)(ii) For non-cancelable material and equipment, payment will be made pursuant to Article 64.2.1(b).

64.2.3 Time and Material **Contracts** or Items: On all **Contracts** or items in a **Contract** where time and material records are specified as the basis for payment of the **Work**, the **Contractor** shall be paid in accordance with Article 26, less all payments previously made pursuant to this **Contract**.

64.2.4 Direct Costs: Direct Costs as used in this article shall mean:

64.2.4(a) The actual purchase price of material and equipment, plus necessary and reasonable delivery costs,

64.2.4(b) The actual cost of labor involved in construction and installation at the Site, and

64.2.4(c) The actual cost of necessary bonds and insurance purchased pursuant to requirements of this **Contract** less any amounts that have been or should be refunded by the **Contractor's** sureties or insurance carriers.

64.2.4(d) Direct Cost shall not include overhead.

64.3 In no event shall any payments under this article exceed the **Contract** price for such items.

64.4 All payments pursuant to this article shall be in the nature of liquidated damages and shall be accepted by the **Contractor** in full satisfaction of all claims against the **City**.

64.5 The **City** may deduct or set off against any sums due and payable pursuant to this article, any deductions authorized by this **Contract** or by **Law** (including but not limited to liquidated damages) and any claims it may have against the **Contractor**. The **City's** exercise of the right to terminate the **Contract** pursuant to this article shall not impair or otherwise effect the **City's** right to assert any claims it may have against the **Contractor** in a plenary action.

64.6 Where the **Work** covered by the **Contract** has been substantially completed, as determined in writing by the **Commissioner**, termination of the **Work** shall be handled as an omission of **Work** pursuant to Articles 29 and 33, in which case a Change Order will be issued to reflect an appropriate reduction in the **Contract** Sum, or if the amount is determined after final payment, such amount shall be paid by the **Contractor**.

ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE

65.1 This **Contract** shall be deemed to be executed in the **City** of New York, State of New York, regardless of the domicile of the **Contractor**, and shall be governed by and construed in accordance with the **Laws** of the State of New York and the **Laws** of the United States, where applicable.

65.2 The parties agree that any and all claims asserted against the **City** arising under this **Contract** or related thereto shall be heard and determined in the courts of the State of New York ("New York State Courts") located in the **City** and County of New York. To effect this **Contract** and intent, the **Contractor** agrees:

65.2.1 If the **City** initiates any action against the **Contractor** in Federal Court or in New York State Court, service of process may be made on the **Contractor** either in person, wherever such **Contractor** may be found, or by registered mail addressed to the **Contractor** at its address as set forth in this **Contract**, or to such other address as the **Contractor** may provide to the **City** in writing; and

65.2.2 With respect to any action between the **City** and the **Contractor** in New York State Court, the **Contractor** hereby expressly waives and relinquishes any rights it might otherwise have:

65.2.2(a) To move to dismiss on grounds of forum non conveniens;

65.2.2(b) To remove to Federal Court; and

65.2.2(c) To move for a change of venue to a New York State Court outside New York County.

65.2.3 With respect to any action brought by the **City** against the **Contractor** in Federal Court located in the **City**, the **Contractor** expressly waives and relinquishes any right it might otherwise have to move to transfer the action to a United States Court outside the **City**.

65.2.4 If the **Contractor** commences any action against the **City** in a Court located other than in the **City** and State of New York, upon request of the **City**, the **Contractor** shall either consent to a transfer of the action to a State Court of competent jurisdiction located in the **City** and State of New York or, if the Court where the action is initially brought will not or cannot transfer the action, the

Contractor shall consent to dismiss such action without prejudice and may thereafter reinstate the action in a State Court of competent jurisdiction in the **City**.

65.3 If any provision(s) of this article is held unenforceable for any reason, each and all other provision(s) shall nevertheless remain in full force and effect.

ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT

66.1 The **Contractor** agrees that neither the **Contractor** nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce promulgated thereunder.

66.2 Upon the final determination by the Commerce Department or any other **Agency** of the United States as to, or conviction of the **Contractor** or a substantially-owned affiliated company thereof, participation in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations promulgated thereunder, the **Comptroller** may, at his/her option, render forfeit and void this **Contract**.

66.3 The **Contractor** shall comply in all respects, with the provisions of Section 6-114 of the Administrative Code and the rules and regulations issued by the **Comptroller** thereunder.

ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM

67.1 This **Contract** is subject to the requirements of Section 6-108.1 of the Administrative Code and regulations promulgated thereunder. No construction **Contract** shall be awarded unless and until these requirements have been complied with in their entirety.

67.2 Unless specifically waived by the **Commissioner** with the approval of the Division of Economic and Financial Opportunity of the Department of Business Services, if any portion of the **Contract** is subcontracted, not less than ten (10%) percent of the total dollar amount of the **Contract** shall be awarded to locally based enterprise ("LBEs"); except that where less than ten (10%) percent of the total dollar amount of the **Contract** is subcontracted, such lesser percentage shall be so awarded.

67.3 The prime **Contractor** shall not require performance and payment bonds from LBE Subcontractors.

67.4 If the **Contractor** has indicated prior to award that no **Work** will be subcontracted, no **Work** shall be subcontracted without the prior approval of the **Commissioner**, which shall be granted only if the **Contractor** makes a good faith effort beginning at least six (6) weeks before the **Work** is to be performed to obtain LBE Subcontractors to perform the **Work**.

67.5 If the **Contractor** has not identified sufficient LBE Subcontractors prior to award, it shall sign a letter of compliance stating that it complies with Section 6-108.1 of the Administrative Code, recognizes that achieving the LBE requirement is a condition of its **Contract**, and shall submit documentation demonstrating its good faith efforts to obtain LBEs. After award, the **Contractor** shall begin to solicit LBE's to perform subcontracted **Work** at least six (6) weeks before the date such **Work** is to be performed and shall demonstrate that a good faith effort has been made to obtain LBE's on each subcontract until it meets the required percentage.

67.6 Failure of the **Contractor** to comply with the requirements of Section 6-108.1 of the Administrative Code and the regulations promulgated thereunder shall constitute a material breach of **Contract**. Remedy for such breach of **Contract** may include the imposition of any or all of the following sanctions:

67.6.1 Reducing a **Contractor's** compensation by an amount equal to the dollar value of the percentage of the LBE subcontracting requirement not complied with;

67.6.2 Declaring the **Contractor** in default;

67.6.3 Where non-compliance is by an LBE, de-certifying and declaring the LBE ineligible to participate in the LBE program for a period of up to three (3) years.

ARTICLE 68. ANTITRUST

68.1 The **Contractor** hereby assigns, sells and transfers to the **City** all right, title and interest in and to any claims and causes of action arising under the antitrust Laws of New York State or of the United States relating to the particular goods or services purchased or procured by the **City** under this **Contract**.

ARTICLE 69. MacBRIDE PRINCIPLES PROVISIONS

69.1 Notice To All Prospective Contractors:

69.1.1 Local Law No. 34 of 1991 became effective on September 10, 1991 and added Section 6-115.1 of the Administrative Code. The local Law provides for certain restrictions on **City Contracts** to express the opposition of the people of the **City** to employment discrimination practices in Northern Ireland to promote freedom of work-place opportunity.

69.1.2 Pursuant to Section 6-115.1, prospective **Contractors** for **Contracts** to provide goods or services involving an expenditure of an amount greater than ten thousand (\$10,000.) dollars, or for construction involving an amount greater than fifteen thousand (\$15,000.) dollars, are asked to sign a rider in which they covenant and represent, as a material condition of their **Contract**, that any business operations in Northern Ireland conducted by the **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** will be conducted in accordance with the MacBride Principles of nondiscrimination in employment.

69.1.3 Prospective **Contractors** are not required to agree to these conditions. However, in the case of **Contracts** let by competitive sealed bidding, whenever the lowest responsible bidder has not agreed to stipulate to the conditions set forth in this notice and another bidder who has agreed to stipulate to such conditions has submitted a bid within five (5%) percent of the lowest responsible bid for a **Contract** to supply goods, services or construction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable Law and rules, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City Charter**.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City Council** shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling to and from Work;

69.3.1(c) ban provocative religious or political emblems from the workplace;

69.3.1(d) publicly advertise all job openings and make special recruitment efforts to attract applicants from under-represented religious groups;

69.3.1(e) establish layoff, recall and termination procedures which do not in practice favor a particular religious group;

69.3.1(f) abolish all job reservations, apprenticeship restrictions and different employment criteria which discriminate on the basis of religion;

69.3.1(g) develop training programs that will prepare substantial numbers of current employees from under-represented religious groups for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade and improve the skills of workers from under-represented religious groups;

69.3.1(h) establish procedures to assess, identify and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative action efforts and develop a timetable to ensure their full implementation.

69.4 The **Contractor** agrees that the covenants and representations in Article 69.2 are material conditions to this **Contract**. In the event the **Agency** receives information that the **Contractor** who made the stipulation required by this Article is in violation thereof, the **Agency** shall review such information and give the **Contractor** an opportunity to respond. If the **Agency** finds that a violation has occurred, the **Agency** shall have the right to declare the **Contractor** in default in default and/or terminate this **Contract** for cause and procure supplies, services or Work from another source in the manner the **Agency** deems proper. In the event of such termination, the

Contractor shall pay to the Agency, or the Agency in its sole discretion may withhold from any amounts otherwise payable to the Contractor, the difference between the Contract price for the uncompleted portion of this Contract and the cost to the Agency of completing performance of this Contract either itself or by engaging another Contractor or Contractors. In the case of a requirement Contract, the Contractor shall be liable for such difference in price for the entire amount of supplies required by the Agency for the uncompleted term of Contractor's Contract. In the case of a construction Contract, the Agency shall also have the right to hold the Contractor in partial or total default in accordance with the default provisions of this Contract, and/or may seek debarment or suspension of the Contractor. The rights and remedies of the Agency hereunder shall be in addition to, and not in lieu of, any rights and remedies the Agency has pursuant to this Contract or by operation of Law.

ARTICLE 70. HEALTH INSURANCE COVERAGE

70.1 If the price for which this Contract was awarded exceeds \$100,000, or if the price for which this Contract was awarded when combined with other construction or services contracts awarded the Contractor by the City in the year prior to award of this Contract exceeds \$100,000, the Contractor, following registration of the Contract, shall be required to submit responses to requests for information regarding the nature of any health insurance provided by the Contractor to its employees and their spouses and domestic partners, upon request of the Agency or other designated City agency.

ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS

71.1 Tropical hardwoods, as defined in Section 165 of the New York State Finance Law ("Finance Law"), shall not be utilized in the performance of this Contract except as expressly permitted by Section 165 of the Finance Law.

ARTICLE 72. CONFLICTS OF INTEREST

72.1 Section 2604 of the City Charter and other related provisions of the City Charter, the Administrative Code and the Penal Law are applicable under the terms of this Contract in relation to Conflicts of Interest and shall be extended to Subcontractors authorized to perform Work, labor and services pursuant to this Contract and further, it shall be the duty and responsibility of the Contractor to so inform its respective Subcontractors. Notice is hereby given that, under certain circumstances, penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

ARTICLE 73. MERGER CLAUSE

73.1 The Written Contract herein, contains all the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

ARTICLE 74. STATEMENT OF WORK

74.1 The Contractor shall furnish all labor and materials and perform all Work in strict accordance with the Specifications and Addenda thereto, numbered two.

ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR

75.1 The City will pay and the Contractor will accept in full consideration for the performance of the Contract, subject to additions and deductions as provided herein, the total sum of: fourteen million Dollars, (\$ 14,710,371.00), this said sum being the Amount at which the Contract was awarded to the Contractor at a public letting thereof, based upon the Contractor's bid for the Contract.
seven hundred ten thousand three hundred seventy one dollars

ARTICLE 76. ELECTRONIC FUNDS TRANSFER

76.1 In accordance with Section 6-107.1 of the New York City Administrative Code, the Contractor agrees to accept payments under this Agreement from the City by electronic funds transfer. An electronic funds transfer is any transfer of funds, other than a transaction originated by check, draft or similar paper instrument, which is initiated through an electronic terminal, telephonic instrument or computer or magnetic tape so as to order, instruct or authorize a financial institution to debit or credit an account. Prior to the first payment made under this Agreement, Contractor shall designate one financial institution or other authorized payment agent and shall complete the attached "EFT Vendor Payment Enrollment Form" in order to provide the Commissioner of Finance with information necessary for Contractor to receive electronic funds transfer payments through the designated financial institution or authorized payment agent. The crediting of the amount of a payment to the appropriate account on the books of a financial institution or other authorized payment agent designated by the Contractor shall constitute full satisfaction by the City for the amount of the payment under this agreement. The account information supplied by the Contractor to facilitate the electronic funds transfer shall remain confidential to the fullest extent provided by law.

76.2 The agency head may waive the application of the requirements herein to payments on contracts entered into pursuant to §315 of the City Charter. In addition, the Commissioner of the Department of Finance and the Comptroller may jointly issue standards pursuant to which the contracting agency may waive the requirements hereunder for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications or types of checks; or (iii) in other circumstances as may be necessary in the interest of the City.

**ARTICLE 77 – PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS
ENTERPRISES IN CITY PROCUREMENT**

NOTICE TO ALL PROSPECTIVE CONTRACTORS

ARTICLE I. M/WBE PROGRAM

Local Law No. 129 of 2005 added Section 6-129 to the Administrative Code of the City of New York. The local law creates a program for participation by minority-owned and women-owned business enterprises (MBEs and WBEs) in City procurement. As stated in the Section 6-129, the intent of the program is to address the impact of discrimination on the City's procurement process, and to promote the public interest in avoiding fraud and favoritism in the procurement process, increasing competition for City business, and lowering contract costs. The contract provisions contained herein are made pursuant to Local Law 129, and the rules of the Department of Small Business Services ("DSBS") promulgated thereunder.

If this Contract is subject to the Minority-Owned and Women-Owned Business Enterprise ("M/WBE") program created by Local Law 129, the specific requirements of M/WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "Subcontractor Utilization Plan"), and are detailed below. The Contractor must comply with all applicable M/WBE requirements for this Contract. Schedule B of the Contract ("Subcontractor Utilization Plan") is included in the Bid Booklet.

Article I, Part A, below, sets forth provisions related to the participation goals for construction and professional services contracts. Article I, Part B, below, sets forth miscellaneous provisions related to the M/WBE program.

**PART A: PARTICIPATION GOALS FOR CONSTRUCTION
AND PROFESSIONAL SERVICES CONTRACTS**

1. The Target Subcontracting Percentage applicable to this Contract is set forth on Schedule B, Part I to this Contract (see Page 1, line (1)). The "Target Subcontracting Percentage" is the percentage of the total Contract which Agency anticipates that the prime contractor for this Contract would in the normal course of business award to one or more subcontractors for amounts under \$1 million for construction and professional services.

A prospective contractor may seek a full or partial pre-award waiver of the Target Subcontracting Percentage in accordance with Local Law 129 and Part A, Section 10 below. To apply for the a full or partial waiver of the Target Subcontracting Percentage, a prospective contractor must complete Part III (Page 4) of Schedule B, and must submit such request no later than seven (7) days prior to the date and time the bids or proposals are due, in writing to the Agency by e-mail at poped@ddc.nyc.gov or via facsimile at (718) 391-1885. Bidders/proposers who have submitted requests will receive a response by no later than two (2) calendar days prior to the date bids or proposals are due, provided, however, that if that date would fall on a weekend or holiday, a response will be provided by close-of-business on the business day before such weekend or holiday date.

2. The Subcontractor Participation Goals established for this Contract are set forth on Schedule B, Part I to this Contract (see Page 1, line (2) and/or line (3)). The Subcontractor Participation Goals represent a percentage of the total dollar value of all construction and/or professional services subcontracts under this Agreement for amounts under \$1 million.

3. If Subcontractor Participation Goals have been established for this Contract, Contractor agrees or shall agree as a material term of the Agreement that, with respect to the total amount of the Agreement to be awarded to one or more subcontractors pursuant to subcontracts for amounts under \$1 million, Contractor shall be subject to the Subcontractor Participation Goals, unless the goals are modified by Agency in accordance with Local Law 129 and Part A, Section 11 below.

4. If Subcontractor Participation Goals have been established for this Contract, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, Part II Subcontractor Utilization Plan (see Page 2-3) indicating: (a) the percentage of work it intends to subcontract; (b) the percentage of work it intends to

award to subcontractors for amounts under \$1 million; (c) in cases where the prospective contractor intends to award subcontracts for amounts under \$1 million, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs; and (d) the general time frames in which such work by MBEs and/or WBEs is scheduled to occur. In the event that this Subcontractor Utilization Plan indicates that the bidder or proposer, as applicable, does not intend to award the **Target Subcontracting Percentage**, the bid or proposal, as applicable, shall be deemed non-responsive, unless Agency has granted the bidder or proposer, as applicable, a pre-award waiver of the **Target Subcontracting Percentage** in accordance with Local Law 129 and Part A, Section 10 below.

THE BIDDER/PROPOSER MUST COMPLETE THE SUBCONTRACTOR UTILIZATION PLAN INCLUDED HEREIN (SCHEDULE B, PART II). SUBCONTRACTOR UTILIZATION PLANS WHICH DO NOT INCLUDE THE REQUIRED AFFIRMATIONS WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE TARGET SUBCONTRACTING PERCENTAGE IS GRANTED (SCHEDULE B PART III). IN THE EVENT THAT THE CITY DETERMINES THAT VENDOR HAS SUBMITTED A SUBCONTRACTOR UTILIZATION PLAN WHERE THE REQUIRED AFFIRMATIONS ARE COMPLETED BUT OTHER ASPECTS OF THE PLAN ARE NOT COMPLETE, OR CONTAIN A COPY OR COMPUTATION ERROR THAT IS AT ODDS WITH THE AFFIRMATION, THE VENDOR WILL BE NOTIFIED BY THE AGENCY AND WILL BE GIVEN FOUR (4) CALENDAR DAYS FROM RECEIPT OF NOTIFICATION TO CURE THE SPECIFIED DEFICIENCIES AND RETURN A COMPLETED PLAN TO THE AGENCY. FAILURE TO DO SO WILL RESULT IN A DETERMINATION THAT THE BID/PROPOSAL IS NON-RESPONSIVE. RECEIPT OF NOTIFICATION IS DEFINED AS THE DATE NOTICE IS EMAILED OR FAXED (IF THE VENDOR HAS PROVIDED AN EMAIL ADDRESS OR FAX NUMBER), OR NO LATER THAN FIVE (5) DAYS FROM THE DATE OF MAILING OR UPON DELIVERY, IF DELIVERED.

5. Where a Subcontractor Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multi-year contracts, such list shall also be submitted every year thereafter. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below \$3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor must identify all those to which it intends to award construction subcontracts for any portion of the Wicks trade work at the time of bid submission, regardless of what point in the life of the contract such subcontracts will occur. In identifying intended subcontractors in the bid submission, bidders may satisfy any Subcontractor Participation Goals established for this Contract by proposing one or more subcontractors that are M/WBEs for any portion of the Wicks trade work if the amount to be awarded to such M/WBE subcontractor is under \$1 million. In the event that the Contractor's selection of a subcontractor is disapproved, the Contractor shall have a reasonable time to propose alternate subcontractors.**

6. M/WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the M/WBE participation goals. Such certification must occur prior to the firms' commencement of work as subcontractors. A list of M/WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6356, or by visiting or writing DSBS at 110 William St., New York, New York, 10038, 7th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311.

7. Where a Subcontractor Utilization Plan has been submitted, the Contractor shall, with each voucher for payment, and/or periodically as Agency may require, submit statements, certified under penalty of perjury, which shall include, but not be limited to, the total amount paid to subcontractors (including subcontractors that are not MBEs or WBEs); the names, addresses and contact numbers of each MBE or WBE hired as a subcontractor pursuant to such plan as well as the dates and amounts paid to each MBE or WBE. The Contractor shall also submit, along with its voucher for final payment, the total amount paid to subcontractors (including subcontractors that are not MBEs or WBEs); and a final list, certified under penalty of perjury, which shall include the name, address and contact information of each subcontractor that is an MBE or WBE hired pursuant to such plan, the work performed by, and the dates and amounts paid to each.

8. If payments made to, or work performed by, MBEs or WBEs are less than the amount specified in the Contractor's Subcontractor Utilization Plan, Agency shall take appropriate action, in accordance with Local Law 129 and Article II below, unless the Contractor has obtained a modification of its Subcontractor Utilization Plan in accordance with Local Law 129 and Part A, Section 11 below.

9. Where a Subcontractor Utilization Plan has been submitted, and the Contractor requests a change order the value of which exceeds 10 percent of the Agreement, Agency shall establish participation goals for the work to be performed pursuant to the change order.

10. **Pre-award waiver of Target Subcontracting Percentage.** Agency may grant a full or partial waiver of the **Target Subcontracting Percentage** to a bidder or proposer, as applicable, who demonstrates—before submission of the bid or proposal—that it has legitimate business reasons for proposing the level of subcontracting in its Subcontractor Utilization Plan. In making its determination, Agency shall consider factors that shall include, but not be limited to, whether the bidder or proposer, as applicable, has the capacity and the bona fide intention to perform the Contract without any subcontracting, or to perform the Contract without awarding the amount of subcontracts for under one million dollars represented by the **Target Subcontracting Percentage**. In making such determination, Agency may consider whether the Subcontractor Utilization Plan is consistent with past subcontracting practices of the bidder or proposer, as applicable, and whether the bidder or proposer, as applicable, has made good faith efforts to identify portions of the Contract that it intends to subcontract.

11. **Modification of Subcontractor Utilization Plan.** A Contractor may request a modification of its Subcontractor Utilization Plan (**Subcontractor Participation Goals**) after award of this Contract. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below \$3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor may request a Modification of its Subcontractor Utilization Plan as part of its bid submission.** The Agency may grant a request for Modification of a Contractor's Subcontractor Utilization Plan if it determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts to meet the **Subcontractor Participation Goals**. In making such determination, Agency shall consider evidence of the following efforts, as applicable, along with any other relevant factors:

- (a) The Contractor advertised opportunities to participate in the Contract, where appropriate, in general circulation media, trade and professional association publications and small business media, and publications of minority and women's business organizations;
- (b) The Contractor provided notice of specific opportunities to participate in the Contract, in a timely manner, to minority and women's business organizations;
- (c) The Contractor sent written notices, by certified mail or facsimile, in a timely manner, to advise MBEs and WBEs that their interest in the Contract was solicited;
- (d) The Contractor made efforts to identify portions of the work that could be substituted for portions originally designated for participation by MBEs and/or WBEs in the Subcontractor Utilization Plan, and for which the Contractor claims an inability to retain MBEs or WBEs;
- (e) The Contractor held meetings with MBEs and/or WBEs prior to the date their bids or proposals were due, for the purpose of explaining in detail the scope and requirements of the work for which their bids or proposals were solicited;
- (f) The Contractor made efforts to negotiate with MBEs and/or WBEs as relevant to perform specific subcontracts;
- (g) Timely written requests for assistance made by the Contractor to Agency's M/WBE liaison officer and to DSBS;
- (h) Description of how recommendations made by DSBS and Agency were acted upon and an explanation of why action upon such recommendations did not lead to the desired level of participation of MBEs and/or WBEs.

Agency's M/WBE officer shall provide written notice to the Contractor of the determination.

12. If this Contract is for an indefinite quantity of construction or professional services or is a requirements type contract and the Contractor has submitted a Subcontractor Utilization Plan and has committed to subcontract work to MBEs and/or WBEs in order to meet the **Subcontractor Participation Goals**, the Contractor will not be deemed in violation of the M/WBE requirements for this Contract with regard to any work which was intended to be subcontracted to an MBE and/or WBE to the extent that the Agency has determined that such work is not needed.

13. If **Subcontractor Participation Goals** have been established for this Contract, Agency shall evaluate and assess the Contractor's performance in meeting those goals, and such evaluation and assessment shall become part of the Contractor's overall contract performance evaluation.

PART B: MISCELLANEOUS

1. The Contractor shall take notice that, if this solicitation requires the establishment of a Subcontractor Utilization Plan, the resulting contract may be audited by DSBS to determine compliance with Section 6-129. See 6-129(e)(10). Furthermore, such resulting contract may also be examined by the City's Comptroller to assess compliance with the Subcontractor Utilization Plan.
2. Pursuant to DSBS rules, construction contracts that include a requirement for a Subcontractor Utilization Plan shall not be subject to the law governing Locally Based Enterprises set forth in Administrative Code Section 6-108.1.
3. DSBS is available to assist contractors and potential contractors in determining the availability of MBEs and WBEs to participate as subcontractors, and in identifying opportunities that are appropriate for participation by MBEs and WBEs in contracts.
4. Prospective contractors are encouraged to enter into joint ventures with MBEs and WBEs.
5. By submitting a bid or proposal the Contractor hereby acknowledges its understanding of the M/WBE requirements set forth herein and the pertinent provisions of Local Law 129 of 2005, and any rules promulgated thereunder, and if awarded this Contract, the Contractor hereby agrees to comply with the M/WBE requirements of this Contract and pertinent provisions of Local Law 129 of 2005, and any rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract. The Contractor hereby agrees to make all reasonable, good faith efforts to solicit and obtain the participation of M/WBE's to meet the required Subcontractor Participation Goals.

ARTICLE II. ENFORCEMENT

1. If Agency determines that a bidder or proposer, as applicable, has, in relation to this procurement, violated Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, Agency may disqualify such bidder or proposer, as applicable, from competing for this Contract and the Agency may revoke such bidder's or proposer's prequalification status, if applicable.
2. Whenever Agency believes that the Contractor or a subcontractor is not in compliance with Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to any Subcontractor Utilization Plan, Agency shall send a written notice to the Contractor describing the alleged noncompliance and offering an opportunity to be heard. Agency shall then conduct an investigation to determine whether such Contractor or subcontractor is in compliance.
3. In the event that the Contractor has been found to have violated Section 6-129, the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements this Section 6-129, including, but not limited to any Subcontractor Utilization Plan, Agency may determine that one of the following actions should be taken:
 - (a) entering into an agreement with the Contractor allowing the Contractor to cure the violation;
 - (b) revoking the Contractor's pre-qualification to bid or make proposals for future contracts;
 - (c) making a finding that the Contractor is in default of the Contract;
 - (d) terminating the Contract;
 - (e) declaring the Contractor to be in breach of Contract;
 - (f) withholding payment or reimbursement;
 - (g) determining not to renew the Contract;
 - (h) assessing actual and consequential damages;
 - (i) assess liquidated damages or reduction of fees, provided that liquidated damages may be based on amounts representing costs of delays in carrying out the purposes of the program established by Section 6-129, or in

meeting the purposes of the Contract, the costs of meeting utilization goals through additional procurements, the administrative costs of investigation and enforcement, or other factors set forth in the Contract;

- (j) exercise rights under the Contract to procure goods, services or construction from another contractor and charge the cost of such contract to the Contractor that has been found to be in noncompliance; or
- (k) take any other appropriate remedy.

4. If a Subcontractor Utilization Plan has been submitted, and pursuant to this Article II, Section 3, the Contractor has been found to have failed to award subcontracts to MBEs and/or WBEs sufficient to meet the Subcontractor Participation Goals contained in its Subcontractor Utilization Plan or the Subcontractor Participation Goals as modified by Agency pursuant to Article I, Part A, Section 11, Agency may assess liquidated damages in the amount of ten percent (10%) of the difference between the dollar amount of subcontracts required to be awarded to MBE and/or WBE subcontractors to meet the Subcontractor Participation Goals and the dollar amount the Contractor actually awarded and paid to MBE and/or WBE subcontractors. In view of the difficulty of accurately ascertaining the loss which the City will suffer by reason of Contractor's failure to meet the Subcontractor Participation Goals, the foregoing amount is hereby fixed and agreed as the liquidated damages that the City will suffer by reason of such failure, and not as a penalty. Agency may deduct and retain out of any monies which may become due under this Contract the amount of any such liquidated damages; and in case the amount which may become due under this Contract shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

5. Whenever Agency has reason to believe that an MBE or WBE is not qualified for certification, or is participating in a contract in a manner that does not serve a commercially useful function (as defined in Section 6-129), or has violated any provision of Section 6-129, Agency shall notify the commissioner of DSBS who shall determine whether the certification of such business enterprise should be revoked.

6. Statements made in any instrument submitted to Agency pursuant to Section 6-129 shall be submitted under penalty of perjury and any false or misleading statement or omission shall be grounds for the application of any applicable criminal and/or civil penalties for perjury. The making of a false or fraudulent statement by an MBE or WBE in any instrument submitted pursuant to Section 6-129 shall, in addition, be grounds for revocation of its certification.

7. The Contractor's record in implementing its Subcontractor Utilization Plan shall be a factor in the evaluation of its performance. Whenever a contracting agency determines that a contractor's compliance with a Subcontractor Utilization Plan has been unsatisfactory, the agency shall, after consultation with the city chief procurement officer, file an advice of caution form for inclusion in VENDEX as caution data.

AUTHORITY

MAYOR'S CERTIFICATE NO. CBX
BUDGET DIRECTOR'S CERTIFICATE NO.

DATED
DATED

APPROPRIATION
COMMISSIONER'S CERTIFICATE

In conformity with the provisions of Section 6-101 of the Administrative Code of the City of New York, it is hereby certified that the estimated cost of the work, materials and supplies required by the within Contract, amounting to

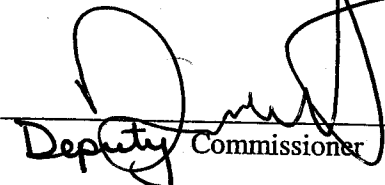
Fourteen million seven hundred
ten thousand three hundred seventy one dollars

Dollars (\$ 14,710,371.00)

is chargeable to the fund of the Department of Design and Construction entitled Code

Department of Design and Construction

I hereby certify that the specifications contained herein comply with the terms and conditions of the BUDGET.


Deputy Commissioner

COMPTROLLER'S CERTIFICATE

The City of New York _____

Pursuant to the provisions of Section 6-101 of the Administrative Code of the City of New York, I hereby certify that there remains unapplied and unexpended a balance of the above mentioned fund applicable to this Contract sufficient to pay the estimated expense of executing the same viz:

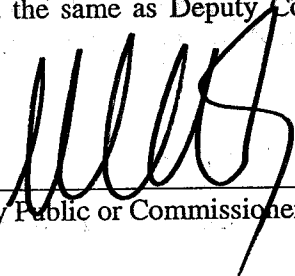
\$ _____

Comptroller

ACKNOWLEDGMENT BY COMMISSIONER

State of New York County of Queens ss:

On this 24th day of October 2013 before me personally came David Resnick
to me known, and known to be the Deputy Commissioner of the Department of Design and Construction of
The City of New York, the person described as such in and who as such executed the foregoing instrument
and he acknowledged to me that he executed the same as Deputy Commissioner for the purposes therein
mentioned.



Notary Public or Commissioner of Deeds

VICTORIA AYO-VAUGHAN
Notary Public, State of New York
Registration #01AY5014042
Qualified In Queens County
Commission Expires July 15, 2015

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:

On this 23 day of Oct, 2013, before me personally came Joseph M. Tonsi
to me known, who, being by me duly sworn did depose and say that he resides at 11 DEER RUN CT
NORTH SHORE N.Y. that he is the Vice Pres. Dist.
of the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the
directors of said corporation, and that he signed his name thereto by like order.


Notary Public or Commissioner of Deeds

VICTORIA AYO-VAUGHAN
Notary Public, State of New York
Registration #01AY5014042
Qualified In Queens County
Commission Expires July 15, 2015

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, before me personally appeared _____
to me known, and known to me to be one of the members of the firm of _____
described in and who executed the foregoing instrument; and he
acknowledged to me that he executed the same as and for the act and deed of said firm.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, before me personally appeared _____
to me known, and known to me to be the person described in and who executed the foregoing instrument; and
acknowledged that he executed the same.

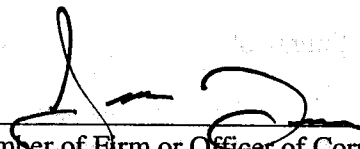
Notary Public or Commissioner of Deeds

IN WITNESS WHEREOF, the Commissioner, on behalf of the City of New York, and the Contractor, have executed this agreement in quadruplicate, two parts of which are to remain with the Commissioner, another to be filed with the Comptroller of the City, and the fourth to be delivered to the Contractor.

THE CITY OF NEW YORK

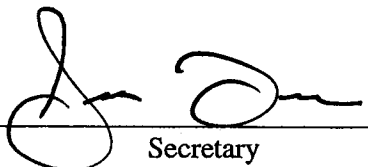
By: 
Deputy Commissioner

CONTRACTOR: Calcedo Construction Corporation

By: 
(Member of Firm or Officer of Corporation)

Title: V.P.

(Where Contractor is a Corporation, add):
Attest:


Secretary

(Seal)

**MAYOR'S CERTIFICATE OR
CERTIFICATE OF THE DIRECTOR
OF THE BUDGET**

Performance Bond #1 (Pages 80 to 83): Use if the total contract price is \$5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA") for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 1)

PERFORMANCE BOND #1

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

hereinafter referred to as the "Principal", and _____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

(\$ _____) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 1)
Bond No. 9119805

PERFORMANCE BOND #2

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

Calcedo Construction Corp. _____

10 Midland Avenue _____

Port Chester, NY 10573 _____

hereinafter referred to as the "Principal", and _____

Fidelity & Deposit Company of Maryland _____

300 Interpace Parkway, Morris Corp. I _____

Parsippany, NJ 07054 _____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

Fourteen Million, Seven Hundred Ten Thousand, Three _____

Hundred Seventy One and 00/100 Dollars _____

(\$ 14,710,371.00) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

FMS ID: F175QUEEN New EMS Station 50 - Borough of Queens _____

DDC PIN: 8502013FI0003C _____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. The document then outlines the specific procedures for recording transactions, including the use of standardized forms and the requirement for double-checking entries.

The second part of the document addresses the issue of data security. It highlights the need to protect sensitive information from unauthorized access and disclosure. To this end, the document recommends implementing robust security measures, such as encryption and access controls, to safeguard the organization's data.

The third part of the document focuses on the importance of regular audits. It states that audits are a critical component of the organization's internal control system, as they help to identify and correct errors and prevent fraud. The document provides guidance on how to conduct effective audits, including the selection of qualified auditors and the use of a systematic approach.

The final part of the document discusses the role of management in ensuring the integrity of the organization's financial reporting. It stresses that management has a responsibility to ensure that all financial information is accurate and reliable. To achieve this, the document recommends that management should establish a strong culture of integrity and transparency, and should actively monitor and promote ethical behavior throughout the organization.

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 2)

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 21st day of October, 2013.

Calcedo Construction Corp.

(Seal)

(L.S.)

Principal

By: _____

Joseph M. Tomei-VP

(Seal)

Fidelity & Deposit Company of Maryland

Surety

By: _____

Theresa A. Lanfranco, Attorney-in-Fact

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

Bond Premium Rate Scaled

Four (4) Executed Originals

Bond Premium Cost \$120,773.00

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

100

100

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of WEST ss:

On this 22 day of Oct, 2013 before me personally came Joseph M. Tomei
to me known, who, being by me duly sworn did depose and say that he/she resides at 11 Deer Run Ct N Salem NY 10560
; that he/she is the Vp of the Calcedo Const.
corporation described in and which executed the foregoing instrument; and that he signed his name to the foregoing
instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

[Signature]
Notary Public or Commissioner of Deeds

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2017

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, 20____ before me personally came _____
to me known, who, being by me duly sworn did depose and say that he/she resides at _____
; that he/she is _____ partner of _____
a limited/general partnership existing under the laws of the State of _____
the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the
going instrument as the duly authorized and binding act of said partnership.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, 20____ before me personally came _____
to me known, who, being by me duly sworn did depose and say that he/she resides at _____
and that he/she is the individual whose name is subscribed to
the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed
the instrument.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties;
(b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by
agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions
of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was
issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

Affix Acknowledgments and Justification of Sureties.

Individual Acknowledgment

State of _____

County of _____

On this _____ day of _____, 20____, before me personally came _____ to me known, and known to me to be the individual in and who executed the foregoing instrument, and acknowledged to me that he/she executed the same.

My commission expires _____

Notary Public

Corporation Acknowledgment

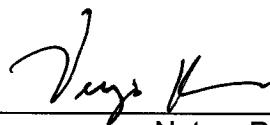
State of NY

County of WEST

On the 22 day of Oct, 2013 before me personally came Joseph M. Tomei to me known; who being by me duly sworn, did depose and say that he/she/they reside(s) in 11 Deer Run Ct N Salem NY 10560 that he/she/they is (are) the VP of the Calcedo Construction, the corporation described in and which executed the above instrument; that he/she/they know(s) the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by authority of the board of directors of said corporation, and that he/she/they signed his/her/their name(s) thereto by like authority.

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County

My commission expires mission Expires Aug. 31, 2017



Notary Public

Surety Acknowledgment

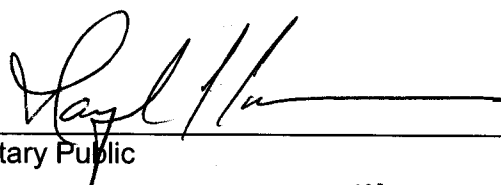
State of New York

County of Nassau

On the 21st day of October, 2013 personally came Theresa A. Lanfranco to me known, who being by me duly sworn did depose and say that he/she is an Attorney-in-Fact of Fidelity and Deposit Company of Maryland in and which executed the above Instrument know(s) the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that he/she/they signed the said instrument and affixed the said seal as Attorney-in-fact by authority of the Board of Directors of said corporation and by authority of this office under the standing resolution thereof.

My commission expires _____

Notary Public



RAYMOND C. CARMAN
Notary Public, State of New York
No. 01CA5617975
Qualified in Nassau County
Commission Expires Jan. 31, 2015

RAYMOND C. CLEGGAN
Notary Public for New York
State
No. 13358
County of ...
State of New York
March 1, 2015

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Raymond C. CARMAN, Theresa A. LANFRANCO, Dominick SCOTTO and Dorothy ELFAWAL, all of Uniondale, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 16th day of January, A.D. 2013.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: _____

Eric D. Barnes

*Assistant Secretary
Eric D. Barnes*

Geoffrey Delisio

*Vice President
Geoffrey Delisio*

State of Maryland
City of Baltimore

On this 16th day of January, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and ERIC D. BARNES, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski

*Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2015*



EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 21st day of October, 2013.



James M. Carroll, Vice President

FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition As Of December 31, 2012

ASSETS

Bonds	\$ 157,177,826
Stocks	23,000,311
Cash and Short Term Investments	119,155
Reinsurance Recoverable	17,923,564
Other Accounts Receivable	35,473,256
TOTAL ADMITTED ASSETS	<u>\$ 233,694,113</u>

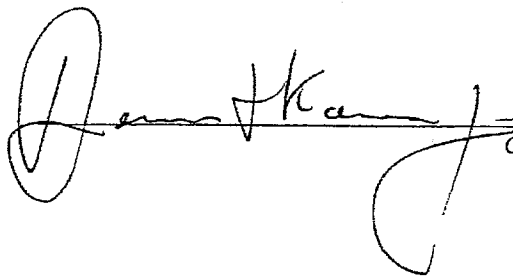
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses	\$ 74,782
Ceded Reinsurance Premiums Payable	48,323,524
Securities Lending Collateral Liability	1,716,240
TOTAL LIABILITIES	<u>\$ 50,114,546</u>
Capital Stock, Paid Up	\$ 5,000,000
Surplus	178,579,567
Surplus as regards Policyholders	183,579,567
TOTAL	<u>\$ 233,694,113</u>

Securities carried at \$59,468,002 in the above statement are deposited as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2012 market quotations for all bonds and stocks owned, the Company's total admitted assets would be \$243,518,971 and surplus as regards policyholders \$193,404,425.

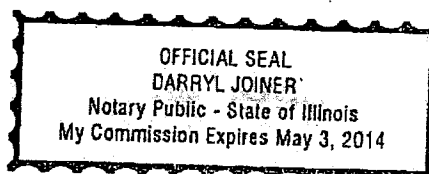
I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2012.


Corporate Secretary

State of Illinois
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2013.


Notary Public



100

1

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND

PAYMENT BOND (Page 1)

Bond No. 9119805

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

Calcedo Construction Corp.

10 Midland Avenue

Port Chester, NY 10573

hereinafter referred to as the "Principal", and _____

Fidelity & Deposit Company of Maryland

300 Interpace Parkway, Morris Corp. I

Parsippany, NJ 07054

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

Fourteen Million, Seven Hundred Ten Thousand, Three

Hundred Seventy One and 00/100 Dollars

14,710,371.00

(\$) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

FMS ID: F175QUEEN, New EMS Station 50 - Borough of Queens

DDC PIN: 8502013FI00003C

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 2)

Engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the project; and

(b) Materials and supplies (whether incorporated in the permanent structure or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any subcontractor at or in the vicinity of the site of the Project in the prosecution of the Work under said Contract and any amendment or extension thereof or addition thereto; then this obligation shall be void, otherwise to remain in full force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies, as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the right of the City to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be placed in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 21st day of October, 2013.

Calcedo Construction Corp.

(Seal)

(L.S.)

Principal

By: _____

Joseph M Tomei-VP

(Seal)

Fidelity & Deposit Company of Maryland

Surety

By: _____

Theresa A Lanfranco, Attorney-in-Fact

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

Four (4) Executed Originals

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of WEST ss:

On this 22 day of Oct, 2013 before me personally came
Joseph M Tomei
to me known, who, being by me duly sworn did depose and say that he resides at
11 Deer Run Ct N Salem NY 10560

that he is the VP of the Calcedo Const.
corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation;
that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said
corporation, and that he signed his name thereto by like order.



Notary Public or Commissioner of Deeds

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2017

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____ before me personally appeared
to me known, and known to me to be one of the members of the firm of
_____ described in and who executed the foregoing instrument; and he acknowledged to
me that he executed the same as and for the act and deed of said firm.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____ before me personally appeared
to me known, and known to me to be the person described in and who executed the foregoing instrument; and
acknowledged that he executed the same.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties;
(b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by
agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions
of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was
issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * *

Affix Acknowledgments and Justification of Sureties

Individual Acknowledgment

State of _____

County of _____

On this _____ day of _____, 20____, before me personally came _____ to me known, and known to me to be the individual in and who executed the foregoing instrument, and acknowledged to me that he/she executed the same.

My commission expires _____

Notary Public

Corporation Acknowledgment

State of NY

County of WEST

On the 22 day of Oct, 2013 before me personally came Joseph M Tomei to me known; who being by me duly sworn, did depose and say that he/she/they reside(s) in 11 Deer Run Ct N Salem NY 10560 that he/she/they is (are) the VP of the Calcedo Const Corp., the corporation described in and which executed the above instrument; that he/she/they know(s) the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by authority of the board of directors of said corporation, and that he/she/they signed his/her/their name(s) thereto by like authority.

VIRGINIA HARDMAN
Notary Public, State of New York
No. 01HA4837295
Qualified in Westchester County
Commission Expires Aug. 31, 2017

My commission expires _____



Notary Public

Surety Acknowledgment

State of New York

County of Nassau

On the 21st day of October, 2013 personally came Theresa A. Lanfranco to me known, who being by me duly sworn did depose and say that he/she is an Attorney-in-Fact of Fidelity and Deposit Company of Maryland in and which executed the above Instrument know(s) the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that he/she/they signed the said instrument and affixed the said seal as Attorney-in-fact by authority of the Board of Directors of said corporation and by authority of this office under the standing resolution thereof.

My commission expires _____



Notary Public

RAYMOND C. CARMAN
Notary Public, State of New York
No. 01CA5817975
Qualified in Nassau County
Commission Expires Jan. 31, 2015

100

100

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Raymond C. CARMAN, Theresa A. LANFRANCO, Dominick SCOTTO and Dorothy ELFAWAL, all of Uniondale, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York, the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 16th day of January, A.D. 2013.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*
Assistant Secretary
Eric D. Barnes

Geoffrey Delisio
Vice President
Geoffrey Delisio

State of Maryland
City of Baltimore

On this 16th day of January, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and ERIC D. BARNES, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, depose and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski

Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2015



EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 21st day of October, 2013.



James M. Carroll, Vice President

FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition As Of December 31, 2012

ASSETS

Bonds	\$ 157,177,826
Stocks	23,000,311
Cash and Short Term Investments	119,155
Reinsurance Recoverable	17,923,564
Other Accounts Receivable	35,473,256
TOTAL ADMITTED ASSETS	<u>\$ 233,694,113</u>

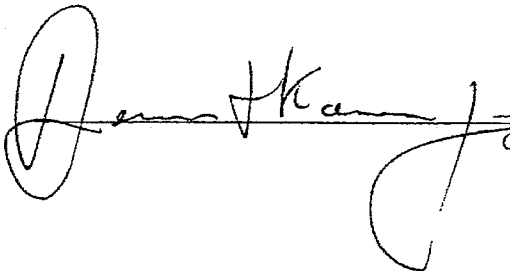
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses	\$ 74,782
Ceded Reinsurance Premiums Payable	48,323,524
Securities Lending Collateral Liability	1,716,240
TOTAL LIABILITIES	<u>\$ 50,114,546</u>
Capital Stock, Paid Up	\$ 5,000,000
Surplus	<u>178,579,567</u>
Surplus as regards Policyholders	183,579,567
TOTAL	<u>\$ 233,694,113</u>

Securities carried at \$59,468,002 in the above statement are deposited as required by law.

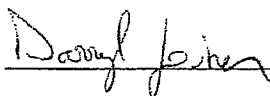
Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2012 market quotations for all bonds and stocks owned, the Company's total admitted assets would be \$243,518,971 and surplus as regards policyholders \$193,404,425.

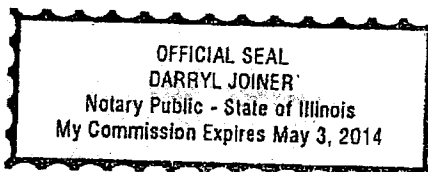
I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2012.


Corporate Secretary

State of Illinois
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2013.


Notary Public



Performance Bond #1 (Pages 80 to 83): Use if the total contract price is \$5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA") for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 2)

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost to complete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city the cost of completion plus any applicable damages and costs under option (1) above, or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed \$100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid for the completion of the Contract as if such sums had not been paid to the Principal, but shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.

PERFORMANCE BOND #1 (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 14th day of March, 2020.

Principal

(5) and being a Surety to furnish the bond up to the full amount of \$100,000.00.

Surety

Surety

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

Performance Bond #1 (Pages 80 to 83): Use if the total contract price is \$5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA") for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of _____ County of _____ ss:

On this _____ day of _____, _____, before me personally came _____ to me known, who, being by me duly sworn did depose and say that he resides at _____ that he is the _____ of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally appeared _____ to me known, and known to me to be one of the members of the firm of _____ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally appeared _____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * *

Affix Acknowledgments and Justification of Sureties

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

hereinafter referred to as the "Principal", and _____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK,
hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of _____

(\$ _____) Dollars, lawful money of the United States, for the payment of which said sum
of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for _____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

Performance Bond #2 (Pages 84 to 87): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this _____ day of _____, _____.

(Seal)

Principal (L.S.)

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

By: _____

(Seal)

Surety

Bond Premium Rate _____

Bond Premium Cost _____

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of _____ County of _____ ss:

On this _____ day of _____, 20____ before me personally came _____
to me known, who, being by me duly sworn did depose and say that he/she resides at _____
_____ ; that he/she is the _____ of _____ the
corporation described in and which executed the foregoing instrument; and that he signed his name to the foregoing
instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, 20____ before me personally came _____
to me known, who, being by me duly sworn did depose and say that he/she resides at _____
_____ ; that he/she is _____ partner of _____
_____, a limited/general partnership existing under the laws of the State of _____,
the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the
foregoing instrument as the duly authorized and binding act of said partnership.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, 20____ before me personally came _____
to me known, who, being by me duly sworn did depose and say that he/she resides at _____
_____, and that he/she is the individual whose name is subscribed to
the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed
the instrument.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties;
(b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by
agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions
of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was
issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * *

Affix Acknowledgments and Justification of Sureties.

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 1)

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

hereinafter referred to as the "Principal", and _____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of _____

(\$ _____) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for _____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 2)

engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the project; and

(b) Materials and supplies (whether incorporated in the permanent structure or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any subcontractor at or in the vicinity of the site of the Project in the prosecution of the Work under said Contract and any amendment or extension thereof or addition thereto; then this obligation shall be void, otherwise to remain in full force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies, as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the right of the City to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be placed in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 3)

IN WITNESS HEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this _____ day of _____, _____.

(Seal) _____ (L.S.)

Principal

By: _____

(Seal) _____

Surety

By: _____

(Seal) _____
Surety

By: _____

(Seal) _____
Surety

By: _____

(Seal) _____
Surety

By: _____

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

Payment Bond (Pages 88 to 91): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally came
_____ to me known, who, being by me duly sworn did depose and say that he resides at
_____ that he is the _____ of the
corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation;
that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said
corporation, and that he signed his name thereto by like order.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally appeared
_____ to me known, and known to me to be one of the members of the firm of
_____ described in and who executed the foregoing instrument; and he acknowledged to
me that he executed the same as and for the act and deed of said firm.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally appeared
_____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and
acknowledged that he executed the same.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties;
(b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by
agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions
of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was
issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * *

Affix Acknowledgments and Justification of Sureties

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**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE**

LABOR LAW §220 PREVAILING WAGE SCHEDULE

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Contractors are solely responsible for maintaining original payroll records which delineate, among other things, the hours each employee worked within a given classification. Contractors using rates and/or classifications not promulgated by the Comptroller do so at their own risk. Additionally, prior to bid, Agency Chief Contracting Officers must contact the Bureau of Labor Law when the need arises for a work classification not published in this schedule.

Pursuant to Labor Law §220 (3) the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work contracts. Contracting agencies anticipating doing work which requires the employment of a trade or classification not included in this schedule must request the Comptroller to establish a proper classification for the work pursuant to Labor Law §220 (3-a) (a). The prevailing rate schedule as promulgated by the Comptroller, must, in compliance with law, be annexed to and form part of the contract.

The appropriate schedule of prevailing wages and benefits must be posted at all public work sites pursuant to Labor Law §220 (3-a) (a).

This schedule is applicable for work performed during the effective period, unless otherwise noted. You will be notified of any changes to this schedule by addenda published on our web site at www.comptroller.nyc.gov. The rate of wages and supplemental benefits to be paid or provided are those that prevail at the time the work is being performed. Preliminary schedules for future one-year periods are published annually in the City Record on or about June 1st of each succeeding year. Final schedules are published on or about July 1st in the City Record and on our web site at www.comptroller.nyc.gov.

The Comptroller's Office has attempted to include all overtime, shift and night differential, Holiday, Saturday, Sunday or other premium time work. However, this schedule does not set forth every prevailing practice with respect to such rates with which employers must comply. All such practices are nevertheless part of the employer's prevailing wage obligation and contained in the collective bargaining agreements of the prevailing wage unions. These collective bargaining agreements are available for inspection by appointment. Requests for appointments may be made by calling (212) 669-4443, Monday through Friday between the hours of 9 a.m. and 5 p.m.

Answers to questions concerning prevailing trade practices may be obtained from the Classification Unit by calling (212) 669-7974. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasyl Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 1122, New York, N.Y. 10007; Fax (212) 669-4002.

Prevailing rates and ratios for apprentices are attached to this schedule in the Appendix. Pursuant to Labor Law §220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the New York State Department of Labor, may be employed on a public work project. Workers who are not journey persons or not registered apprentices pursuant to Labor Law §220 (3-e) may not be substituted for apprentices and must be paid as journey persons.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Prevailing Rate Schedule Information: The information below is intended to assist you in meeting your prevailing wage rate obligation.

Covered Workers: Any and all individuals who are engaged, employed or otherwise occupied as Workers, Laborers or Mechanics on the public work site.

Contractors are advised to review the applicable Collective Bargaining Agreements and the Comptroller's Prevailing Wage Schedule before bidding on Public Work. If there are any questions concerning prevailing wages, benefits, overtime, Holiday pay, shift differentials or any prevailing practice, please contact this office.

Public Work construction, reconstruction, demolition, excavation, rehabilitation, repair, renovation, alteration, or improvement contracts awarded pursuant to a Project Labor Agreement ("PLA") in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA's pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor's Office of Contract Services (MOCS) web page at <http://www.nyc.gov/html/mocs/html/vendors/pla.shtml>.

All the provisions of Labor Law section 220 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller; however, we will enforce shift, premium, overtime and other non-standard rates as they appear in a project's pre-negotiated labor agreement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

- 1) Provide bona-fide benefits which cost the employer no less than the prevailing supplemental benefits rate; or
- 2) Supplement the employee's hourly wage by an amount no less than the prevailing supplemental benefits rate; or
- 3) Provide a combination of bona-fide benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.

Particular attention should be given to the supplemental benefits requirement. Although in most instances the payment or provision for supplemental benefits is for each hour worked, some classifications require the payment or provision of supplemental benefits for each hour paid. Consequently, some prevailing practices require benefits to be purchased at the overtime, shift differential, Holiday, Saturday, Sunday or other premium time rate.

Benefits are paid for EACH HOUR WORKED unless otherwise noted.

Wasył Kinach, P.E.
Director of Classifications
Bureau of Labor Law

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

220 SCHEDULE OF PREVAILING WAGES AND SUPPLEMENTAL BENEFITS ADDENDUM
EFFECTIVE PERIOD JANUARY 1, 2013 THROUGH JUNE 30, 2013

List of Amended Classifications

1. BOILERMAKER
2. CEMENT MASON
3. DERRICKPERSON AND RIGGER
4. DRIVER: TRUCK (TEAMSTER)
5. ENGINEER - FIELD (BUILDING CONSTRUCTION)
6. ENGINEER - OPERATING
7. HEAT AND FROST INSULATOR
8. HOUSE WRECKER
9. IRON WORKER - ORNAMENTAL
10. IRON WORKER - STRUCTURAL
11. MASON TENDER
12. MASON TENDER (INTERIOR DEMOLITION WORKER)
13. MOSAIC MECHANIC
14. PAPERHANGER
15. PLASTERER
16. PLASTERER - TENDER
17. PLUMBER
18. PLUMBER (MECHANICAL EQUIPMENT AND SERVICE)
19. PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)
20. ROOFER

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

21. SHEET METAL WORKER

22. SIGN ERECTOR

23. STEAMFITTER

24. STEAMFITTER - REFRIGERATION AND AIR CONDITIONER

25. TILE FINISHER

26. TILE LAYER - SETTER

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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§220 PREVAILING WAGE SCHEDULE

ASBESTOS HANDLER

(Hazardous Material; Disturbs, removes, encapsulates, repairs, or encloses friable asbestos material)

Asbestos Handler

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$35.10

Supplemental Benefit Rate per Hour: \$14.85

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Sunday.

Time and one half the regular hourly rate after 40 hours in any work week.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Easter

Paid Holidays

None

(Local #78)

BLASTER

Blaster

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$43.20

Supplemental Benefit Rate per Hour: \$37.29

Blaster (Hydraulic)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$43.95

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Trac Drill Hydraulic

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.96

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.24

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Operators of Jack Hammers

Chippers: Spaders: Concrete Breakers: and all other pneumatic tools of like usage: Walk Behind Self Propelled Hydraulic Asphalt and Concrete Breakers: Hydro (Water) Demolition

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.29

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Powder Carriers

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$33.73

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Hydraulic Trac Drill Chuck Tender

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$32.57

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Chuck Tender & Nipper

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$31.88

Supplemental Benefit Rate per Hour: \$37.29

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$19.26

Supplemental Benefit Rate per Hour: \$37.29

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Overtime Description

For Blaster - Magazine Keepers: (Watch Person) only - time and one half the regular rate for work after an 8 hour day, Saturday, Sunday and holidays listed below.

Overtime

Double time the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

A single shift shall be 8 hours plus an unpaid lunch, starting at 8:00 A.M. (or between 6:00 A.M. and 10:00 A.M. on weekdays). When two (2) shifts are employed, each shift shall be 8 hours plus ½ hour unpaid lunch. When three (3) shifts are employed, each shift will work seven and one-half (7 ½) hours, but will be paid for eight (8) hours, since only one-half (½) hour is allowed for mealtime. When two (2) or more shifts are employed, single time will be paid for each shift. The first 8 hours of any and all work performed Monday through Friday inclusive of any off-shift shall be at the single time rate.

(Local #29)

BOILERMAKER

Boilermaker

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$47.98

Supplemental Benefit Rate per Hour: \$37.88

Supplemental Note: The above rate applies to repair or maintenance and new construction; For time and one half overtime - \$56.36; For double overtime - \$74.86.

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate per Hour: \$49.47

Supplemental Benefit Rate per Hour: \$39.48

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE**

Supplemental Note: The above rate applies to repair or maintenance and new construction; For time and one half overtime - \$58.78; For double overtime - \$78.07.

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate per Hour: \$49.47

Supplemental Benefit Rate per Hour: \$39.78

Supplemental Note: The above rate applies to repair or maintenance and new construction; For time and one half overtime - \$59.08; For double overtime - \$78.37.

Overtime Description

For Repair and Maintenance work:

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

For New Construction work:

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

Quadruple time the regular rate for work on the following holiday(s).

Labor Day

Paid Holidays

Good Friday

Day after Thanksgiving

Day before Christmas

Day before New Year's Day

Shift Rates

When shifts are required, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work seven and one-half (7 ½) hours and receive eight hours at the regular straight time hourly rate plus twenty-five cents (\$0.25) per hour. The third shift shall work seven (7) hours and receive eight hours at the regular straight time hourly rate plus fifty cents (\$0.50) per hour. A thirty (30) minute lunch period shall not be considered as time worked. Work in excess of the above shall be paid overtime at the appropriate new construction work or repair work overtime wage and supplemental benefit hourly rate.

(Local #5)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

BRICKLAYER

Bricklayer

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.44

Supplemental Benefit Rate per Hour: \$27.53

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

Overtime rates to be paid outside the regular scheduled work day.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.15

Supplemental Benefit Rate per Hour: \$38.50

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight hours pay for seven hours of work, nine hours pay for eight hours of work. There must be a first shift in order to work a second shift.

(Carpenters District Council)

CARPENTER - HEAVY CONSTRUCTION WORK (Construction of Engineering Structures and Building Foundations)

Heavy Construction Work

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.74

Supplemental Benefit Rate per Hour: \$42.37

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work, commencing between 5:00 P.M. and 10:00 P.M. shall work eight and one half hours allowing for one half hour for lunch, but will be paid for 9 hours including benefits at the straight time rate for 8 hours.

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Cement & Concrete Worker

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.98

Supplemental Benefit Rate per Hour: \$25.67

Supplemental Note: \$28.42 on Saturdays; \$31.17 on Sundays & Holidays

Overtime Description

Time and one half the regular rate after 7 hour day (time and one half the regular rate after an 8 hour day when working with Dockbuilders on pile cap forms and for work below street level to the top of the foundation wall, not to exceed 2 feet or 3 feet above the sidewalk-brick shelf, when working on the foundation and structure.)

Overtime

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Paid Holidays

1/2 day before Christmas Day
1/2 day before New Year's Day

Shift Rates

On shift work extending over a twenty-four hour period, all shifts are paid at straight time.

(Cement Concrete Workers District Council)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$42.50

Supplemental Benefit Rate per Hour: \$39.06

Supplemental Note: Overtime supplemental benefit rate per hour: \$57.56

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$37.63

Supplemental Benefit Rate per Hour: \$39.06

Supplemental Note: Overtime supplemental benefit rate per hour: \$57.56

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Shift Rates

For an off shift day, (work at times other than the regular 7:00 A.M. to 3:30 P.M. work day) a cement mason shall be paid at the regular hourly rate plus a 25% per hour differential.

(Local #780)

CORE DRILLER

Core Driller

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$35.44**

Supplemental Benefit Rate per Hour: **\$19.75**

Core Driller Helper

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$28.60**

Supplemental Benefit Rate per Hour: **\$19.75**

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$25.74**

Supplemental Benefit Rate per Hour: **\$19.75**

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$22.88**

Supplemental Benefit Rate per Hour: **\$19.75**

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$20.02**

Supplemental Benefit Rate per Hour: **\$19.75**

Overtime Description

Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Double time the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Shift Rates

The shift day shall be the continuous eight and one-half (8½) hours from 6:00 A.M. to 2:30 P.M. and from 2:30 P.M. to 11:00 P.M., including one-half (½) hour of employees regular rate of pay for lunch. When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive seventy-five cents (\$0.75) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$40.50

Supplemental Benefit Rate per Hour: \$42.07

Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. \$43.49 - For work performed in Staten Island.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$41.00

Supplemental Benefit Rate per Hour: \$46.07

Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. \$47.49 - For work performed in Staten Island.

Derrick Person & Rigger - Site Work

For site work where no rigging is involved.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$30.00

Supplemental Benefit Rate per Hour: \$31.32

Overtime Description

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The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits. Deduct \$1.42 from the Staten Island hourly benefits rate before computing overtime.

Overtime

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

(Local #197)

DIVER

Diver (Marine)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$58.95**

Supplemental Benefit Rate per Hour: **\$42.37**

Diver Tender (Marine)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$42.10**

Supplemental Benefit Rate per Hour: **\$42.37**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

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\$220 PREVAILING WAGE SCHEDULE

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.74

Supplemental Benefit Rate per Hour: \$42.37

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

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None

Shift Rates

Off shift work, commencing between 5:00 P.M. and 10:00 P.M., shall work eight and one half hours allowing for one half hour for lunch but will be paid the straight time hourly wage for 9 hours and the straight time supplemental benefits for 8 hours.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Automobile Chauffeur (Dump Truck)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$35.84

Supplemental Benefit Rate per Hour: \$36.93

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$37.01

Supplemental Benefit Rate per Hour: \$38.65

Driver - Heavy Equipment Trailer Driver

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$37.34

Supplemental Benefit Rate per Hour: \$36.93

Note: For time and one half overtime Wage Rate - \$53.76; for double time overtime Wage Rate - \$71.68

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$38.51

Supplemental Benefit Rate per Hour: \$38.65

Note: For time and one half overtime Wage Rate - \$55.51; for double time overtime Wage Rate - \$74.01

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$36.41

Supplemental Benefit Rate per Hour: \$36.93

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$37.57

Supplemental Benefit Rate per Hour: \$38.65

Driver - Six Wheeler(3 Axle) Tractors & Trailers

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Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$36.84

Supplemental Benefit Rate per Hour: \$36.93

Note: For time and one half overtime Wage Rate - \$54.62; for double time overtime Wage Rate - \$72.82

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$38.01

Supplemental Benefit Rate per Hour: \$38.65

Note: For time and one half overtime Wage Rate - \$56.36; for double time overtime Wage Rate - \$75.14

Driver - Boom Truck

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$37.09

Supplemental Benefit Rate per Hour: \$36.93

Note: For time and one half overtime Wage Rate - \$54.62; for double time overtime Wage Rate - \$72.82

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$38.26

Supplemental Benefit Rate per Hour: \$38.65

Note: For time and one half overtime Wage Rate - \$56.36; for double time overtime Wage Rate - \$75.14

Overtime Description

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay. For Thanksgiving week, the prorated share shall be 5 1/3 hours of holiday pay for each day worked in Thanksgiving week.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

President's Day

Columbus Day

Veteran's Day

Day after Thanksgiving

Triple time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

New Year's Day

President's Day

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Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Driver - Redi-Mix Driver (Sand & Gravel)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.47

Supplemental Benefit Rate per Hour: \$38.65

Overtime Description

For Paid Holidays: Employees working two (2) days in the calendar week in which the holiday falls are to paid for these holidays, provided they shape each remaining workday during that calendar week.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).

New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

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(Local #282)

ELECTRICIAN

(Including all low voltage cabling carrying data; video; and voice in combination with data and or video.)

Electrician "A" (Regular Day)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$51.00
Supplemental Benefit Rate per Hour: \$42.45

Electrician "A" (Regular Day Overtime)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$76.50
Supplemental Benefit Rate per Hour: \$45.13

Electrician "A" (Day Shift)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$51.00
Supplemental Benefit Rate per Hour: \$42.45

Electrician "A" (Day Shift Overtime After 8 hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$76.50
Supplemental Benefit Rate per Hour: \$45.13

Electrician "A" (Swing Shift)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$59.84
Supplemental Benefit Rate per Hour: \$48.20

Electrician "A" (Swing Shift Overtime After 7.5 hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$89.76
Supplemental Benefit Rate per Hour: \$51.36

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Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$67.03

Supplemental Benefit Rate per Hour: \$53.07

Electrician "A" (Graveyard Shift Overtime After 7 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$100.55

Supplemental Benefit Rate per Hour: \$56.60

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on a holiday.

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

Shift Rates

When so elected by the Employer, one or more shifts of at least five days duration may be scheduled as follows:

Day Shift: 8:00 am to 4:30 pm, Swing Shift 4:30 pm to 12:30 am, Graveyard Shift: 12:30 am to 8:00 am.

For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate.

Electrician "M" (First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service,

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§220 PREVAILING WAGE SCHEDULE

maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$25.30

Supplemental Benefit Rate per Hour: \$17.52

Electrician "M" (Overtime After First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.95

Supplemental Benefit Rate per Hour: \$18.85

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

(Local #3)

ELECTRICIAN - ALARM TECHNICIAN

(Scope of Work - Inspect, test, repair, and replace defective, malfunctioning, or broken devices, components and controls of Fire, Burglar and Security Systems)

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Alarm Technician

Effective Period: 7/1/2012 - 3/9/2013

Wage Rate per Hour: \$29.90

Supplemental Benefit Rate per Hour: \$13.70

Supplemental Note: \$12.20 only after 8 hours worked in a day

Effective Period: 3/10/2013 - 6/30/2013

Wage Rate per Hour: \$30.40

Supplemental Benefit Rate per Hour: \$13.90

Supplemental Note: \$12.40 only after 8 hours worked in a day

Overtime Description

Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.

Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:00 A.M.

Vacation

At least 1 year of employment.....ten (10) days

5 years or more of employment.....fifteen (15) days

10 years of employment.....twenty (20) days

Plus one Personal Day per year

Sick Days:

One day per Year

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(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$51.00**
Supplemental Benefit Rate per Hour: **\$44.18**

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$38.66**
Supplemental Benefit Rate per Hour: **\$34.12**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$33.10**
Supplemental Benefit Rate per Hour: **\$30.84**

Overtime Description

Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.

Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.

Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

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(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2012 - 3/16/2013

Wage Rate per Hour: \$55.20

Supplemental Benefit Rate per Hour: \$32.78

Effective Period: 3/17/2013 - 6/30/2013

Wage Rate per Hour: \$57.01

Supplemental Benefit Rate per Hour: \$34.48

Overtime Description

For New Construction: work performed after 7 or 8 hour day, Saturday, Sunday or between 4:30pm and 7:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 7:00 am shall be paid time and one half.

Overtime

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Vacation

Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

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ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2012 - 3/16/2013

Wage Rate per Hour: \$43.79

Supplemental Benefit Rate per Hour: \$31.37

Effective Period: 3/17/2013 - 6/30/2013

Wage Rate per Hour: \$45.14

Supplemental Benefit Rate per Hour: \$33.02

Overtime Description

For Service Work: Double time - all work performed on Sundays, Holidays, and between midnight and 7:00am.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

For Modernization Work (4pm to 12:30am) - regularly hourly rate plus a (15%) fifteen percent differential.

Vacation

Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ENGINEER

Engineer - Heavy Construction Operating Engineer I

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Cherry pickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$58.75**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: \$55.74 on overtime

Shift Wage Rate: **\$94.00**

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherry pickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar nature, shot blaster, skid steer machines and machines of a similar nature including bobcat, pile rig rubber-tired excavator (37,000 lbs. and under), 2 man auger.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$57.00**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: \$55.74 on overtime

Shift Wage Rate: **\$91.20**

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling and Manning of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$56.74**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: \$55.74 on overtime

Shift Wage Rate: **\$90.78**

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Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$74.44**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: **\$55.74** on overtime

Shift Wage Rate: **\$119.10**

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$37.56**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: **\$55.74** on overtime

Shift Wage Rate: **\$60.10**

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$38.53**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: **\$55.74** on overtime

Shift Wage Rate: **\$61.65**

Engineer - Heavy Construction Operating Engineer III

Minor Equipment such as Tractors, Post Hole Diggers, Ditch Witch (Walk Behind), Road Finishing Machines, Rollers five tons and under, Tugger Hoists, Dual Purpose Trucks, Fork Lifts, and Dempsey Dumpers, Fireperson.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$54.09**

Supplemental Benefit Rate per Hour: **\$31.07**

Supplemental Note: **\$55.74** on overtime

Shift Wage Rate: **\$86.54**

Engineer - Heavy Construction Oilers I

Gradalls, Cold Planer Grader, Concrete Pumps, Driving Truck Cranes, Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$51.19**

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Supplemental Benefit Rate per Hour: \$31.07

Supplemental Note: \$55.74 on overtime

Shift Wage Rate: \$81.90

Engineer - Heavy Construction Oilers II

All gasoline, electric, diesel or air operated Shovels, Draglines, Backhoes, Keystones, Pavers, Gunite Machines, Battery of Compressors, Crawler Cranes, two-person Trenching Machines.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$35.50

Supplemental Benefit Rate per Hour: \$31.07

Supplemental Note: \$55.74 on overtime

Shift Wage Rate: \$56.80

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$54.33

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Shift Wage Rate: \$86.93

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$50.91

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Shift Wage Rate: \$81.46

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$39.04

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Shift Wage Rate: \$62.46

Overtime Description

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$51.62

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$40.34

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Engineer - Building Work Oilers I

All gasoline, electric, diesel or air operated Gradealls: Concrete Pumps, Overhead Cranes in Power Houses: Their duties shall be to assist the Engineer in oiling, greasing and repairing of all machines; Driving Truck

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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Cranes: Driving and Operating Fuel and Grease Trucks, Cherrypickers (hydraulic cranes) over 70,000 GVW, and machines of a similar nature.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$49.12

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Engineer - Building Work Oilers II

Oilers on Crawler Cranes, Backhoes, Trenching Machines, Gunite Machines, Compressors (three or more in Battery).

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$36.75

Supplemental Benefit Rate per Hour: \$29.66

Supplemental Note: \$53.17 on overtime

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Shift Rates

Off Shift: double time the regular hourly rate.

(Local #15)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$34.61
Supplemental Benefit Rate per Hour: \$17.30

Instrument Person

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$28.59
Supplemental Benefit Rate per Hour: \$17.30

Rodperson

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$24.79
Supplemental Benefit Rate per Hour: \$17.30

Overtime Description

Overtime Benefit Rate - \$23.63 per hour (time & one half) \$29.95 per hour (double time).
Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (BUILDING CONSTRUCTION)
(Construction of Building Projects, Concrete Superstructures, etc.)

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Field Engineer - BC Party Chief

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$53.64

Supplemental Benefit Rate per Hour: \$26.95

Supplemental Note: Overtime Benefit Rate - \$37.48 per hour (time & one half) \$48.00 per hour (double time).

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$55.74

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime Benefit Rate - \$41.40 per hour (time & one half) \$53.06 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$41.94

Supplemental Benefit Rate per Hour: \$26.95

Supplemental Note: Overtime Benefit Rate - \$37.48 per hour (time & one half) \$48.00 per hour (double time).

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$43.30

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime Benefit Rate - \$41.40 per hour (time & one half) \$53.06 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$27.52

Supplemental Benefit Rate per Hour: \$26.95

Supplemental Note: Overtime Benefit Rate - \$37.48 per hour (time & one half) \$48.00 per hour (double time).

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$27.97

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime Benefit Rate - \$41.40 per hour (time & one half) \$53.06 per hour (double time).

Overtime Description

Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (HEAVY CONSTRUCTION)
(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations,
Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$60.28

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime benefit rate - \$41.40 per hour (time & one half), \$53.06 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$44.28

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime benefit rate - \$41.40 per hour (time & one half), \$53.06 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.11

Supplemental Benefit Rate per Hour: \$29.73

Supplemental Note: Overtime benefit rate - \$41.40 per hour (time & one half), \$53.06 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

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Thanksgiving Day
Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$54.50**

Supplemental Benefit Rate per Hour: **\$26.95**

Supplemental Note: Overtime benefit rate - \$37.48 per hour (time & one half), \$48.00 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$42.63**

Supplemental Benefit Rate per Hour: **\$26.95**

Supplemental Note: Overtime benefit rate - \$37.48 per hour (time & one half), \$48.00 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$28.84**

Supplemental Benefit Rate per Hour: **\$26.95**

Supplemental Note: Overtime benefit rate - \$37.48 per hour (time & one half), \$48.00 per hour (double time).

Overtime Description

Time and one half the regular rate for Saturday for the first eight hours worked.

Double time the regular rate for Saturday for work performed in excess of eight hours.

Overtime

Time and one half the regular rate after an 8 hour day.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day

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Veteran's Day
Thanksgiving Day
Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - OPERATING

Operating Engineer - Road & Heavy Construction I

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$64.38

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$103.01

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$66.70

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: 51.85 overtime hours

Shift Wage Rate: \$106.72

Operating Engineer - Road & Heavy Construction III

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$68.86

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$110.18

Operating Engineer - Road & Heavy Construction IV

Gradealls, Keystones, Cranes on land or water (with digging buckets), Bridge Cranes, Vermeer Cutter and machines of a similar nature, Trenching Machines.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$67.21

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Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$107.54

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (employing Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$65.86
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$105.38

Operating Engineer - Road & Heavy Construction VI

Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power Houses (Low Air Pressure Units).

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$62.51
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$100.02

Operating Engineer - Road & Heavy Construction VII

Barrier Movers , Barrier Transport and Machines of a Similar Nature.

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$50.27
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$80.43

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$36.37
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$46.38

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$38.78
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

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Shift Wage Rate: \$49.16

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$56.24

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$89.98

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$59.39

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$95.02

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$54.50

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$87.20

Operating Engineer - Road & Heavy Construction XI

Compressors (Portable 3 or more in battery), Driving of Truck Mounted Compressors, Well-point Pumps, Tugger Machines Well Point Pumps, Churn Drill.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$42.11

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$67.38

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$63.18

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$101.09

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Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Well Drilling Machines, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$61.14

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$97.82

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$58.34

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$93.49

Operating Engineer - Road & Heavy Construction XV

Compressors (Portable Single or two in Battery, not over 100 feet apart), Pumps (River Cofferdam) and Welding Machines, Push Button Machines, All Engines Irrespective of Power (Power-Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$39.03

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$62.45

Operating Engineer - Road & Heavy Construction XVI

Concrete Breaking Machines, Single Drum Hoists, Locomotives (over ten tons) and Dinkies over ten tons, Hydraulic Crane-Second Engineer.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$55.73

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$89.17

Operating Engineer - Road & Heavy Construction XVII

On-Site concrete plant engineer, On-site Asphalt Plant Engineer, and Vibratory console.

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Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$56.19

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$89.90

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$81.09

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$129.74

Operating Engineer - Paving I

Asphalt Spreaders, Autogrades (C.M.I.), Roto/Mil

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$59.25

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$94.80

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$62.51

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$100.02

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$57.65

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$92.24

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$60.85

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Shift Wage Rate: \$97.36

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Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$48.46
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$77.54

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$51.32
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$82.11

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$63.49
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$36.91
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$50.31
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2012 - 12/31/2012

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Wage Rate per Hour: \$67.62
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$108.19

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$70.50
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$112.80

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes and Fork Lifts.

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$64.91
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$103.86

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$67.71
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$108.34

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$37.87
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$60.59

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$39.86
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$63.78

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine.

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$36.00

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Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$57.60

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$37.93
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours
Shift Wage Rate: \$60.69

Operating Engineer - Building Work I

Forklifts, House Cars, Rack and Pinion, Plaster (Platform machine), Plaster Bucket, Concrete Pump and all other equipment used for hoisting material.

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$53.09
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$55.46
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), House Car (settlement basis only), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$39.35
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$41.32
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$60.66
Supplemental Benefit Rate per Hour: \$28.65
Supplemental Note: \$51.85 overtime hours

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Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$63.25

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$64.35

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$67.05

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$59.17

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$61.72

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$58.53

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$61.06

Supplemental Benefit Rate per Hour: \$28.65

Supplemental Note: \$51.85 overtime hours

Overtime Description

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On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Shift Rates

Shifts may be worked at the single time rate at other than the regular working hours (8:00 A.M. to 4:30 P.M.) on the following work ONLY: Heavy construction jobs on work below the street level, over railroad tracks and on building jobs.

(Operating Engineer Local #14)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.15

Supplemental Benefit Rate per Hour: \$38.50

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Two shifts may be utilized with the first shift working 8:00 A.M. to the end of the shift at the straight time of pay. The second shift will receive one hour at double time rate for the last hour of the shift. (eight for seven, nine for eight).

(Carpenters District Council)

GLAZIER

(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: \$40.00

Supplemental Benefit Rate per Hour: \$32.89

Supplemental Note: Supplemental Benefit Overtime Rate: \$40.54

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate per Hour: \$40.50

Supplemental Benefit Rate per Hour: \$33.24

Supplemental Note: Supplemental Benefit Overtime Rate: \$41.24

Overtime Description

An optional 8th hour can be worked at straight time rate. If 9th hour is worked, then both hours or more (8th & 9th or more) will be at the double time rate of pay.

Overtime

Double time the regular rate after a 7 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

Shifts shall be any 7 hours beyond 4:00 P.M. for which the glazier shall receive 8 hours pay for 7 hours worked.

(Local #1281)

GLAZIER -REPAIR & MAINTENANCE

(For the Installation of Glass - All repair and maintenance work on a particular building, whenever performed, where the total cumulative contract value is under \$105,000. Except where enumerated (i.e. plate glass windows) does not apply to non-residential buildings.)

Craft Jurisdiction for repair, maintenance and fabrication

Plate glass replacement, Residential glass replacement, Residential mirrors and shower doors, Storm windows and storm doors, Residential replacement windows, Herculite door repairs, Door closer repairs, Retrofit apartment house (non commercial buildings), Glass tinting.

Effective Period: 7/1/2012 - 4/30/2013

Wage Rate per Hour: \$23.40

Supplemental Benefit Rate per Hour: \$18.04

Effective Period: 5/1/2013 - 6/30/2013

Wage Rate per Hour: \$23.50

Supplemental Benefit Rate per Hour: \$18.54

Overtime

Time and one half the regular rate after an 8 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Double time the regular rate for Sunday.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

(Local #1281)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$54.28**

Supplemental Benefit Rate per Hour: **\$31.36**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$55.98**

Supplemental Benefit Rate per Hour: **\$32.36**

Overtime Description

Double time shall be paid for supplemental benefits during overtime work.

8th hour paid at time and one half.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Christmas Day

Triple time the regular rate for work on the following holiday(s).

Labor Day

Paid Holidays

None

Shift Rates

The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium.

Off hour work in occupied or retail buildings may be worked on weekdays with an increment of \$1.00 per hour and eight hours pay for seven (7) hours worked. Double time will apply for over seven (7) hours worked on weekdays, weekends or holidays.

(Local #12)

**HOUSE WRECKER
(TOTAL DEMOLITION)**

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter shall be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). The 10th and 20th House Wrecker shall be apprentices. Other House Wreckers shall be Tier B House Wreckers.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$33.00

Supplemental Benefit Rate per Hour: \$24.15

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$33.51

Supplemental Benefit Rate per Hour: \$24.64

House Wrecker - Tier B

On all work sites the first, second, eleventh and every third House Wrecker thereafter shall be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). The 10th and 20th House Wrecker shall be apprentices. Other House Wreckers shall be Tier B House Wreckers.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$23.05

Supplemental Benefit Rate per Hour: \$17.85

Effective Period: 1/1/2013 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$23.25

Supplemental Benefit Rate per Hour: \$18.35

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

Iron Worker - Ornamental

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$41.50

Supplemental Benefit Rate per Hour: \$39.52

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$42.00

Supplemental Benefit Rate per Hour: \$42.89

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

Time and one half the regular rate after a 7 hour day for a maximum of two hours on any regular work day (the 8th and 9th hour) and double time shall be paid for all work on a regular work day thereafter, time and one half the regular rate for Saturday for the first seven hours of work and double time shall be paid for all work on a Saturday thereafter.

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

For off shift work - 8 hours pay for 7 hours of work. When two or three shifts are employed on a job, Monday through Friday, the workday for each shift shall be seven hours and paid for ten and one-half hours at the single time rate. When two or three shifts are worked on Saturday, Sunday or holidays, each shift shall be seven hours and paid fifteen and three-quarters hours.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$45.05

Supplemental Benefit Rate per Hour: \$57.85

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$46.00

Supplemental Benefit Rate per Hour: \$61.23

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time.

Overtime

Time and one half the regular rate after an 8 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

(Local #40 & #361)

LABORER

(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer

Excavation and foundation work for buildings, heavy construction, engineering work, and hazardous waste removal in connection with the above work. Landscaping tasks in connection with heavy construction work, engineering work and building projects. Projects include, but are not limited to pollution plants, sewers, parks, subways, bridges, highways, etc.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.70

Supplemental Benefit Rate per Hour: \$31.75

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LANDSCAPING

(Landscaping tasks, as well as tree pruning, tree removing, spraying and maintenance in connection with the planting of street trees and the planting of trees in city parks but not when such activities are performed as part of, or in connection with, other construction or reconstruction projects.)

Landscaper (Above 6 years experience)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$24.25
Supplemental Benefit Rate per Hour: \$12.30

Landscaper (3 - 6 years experience)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$23.25
Supplemental Benefit Rate per Hour: \$12.30

Landscaper (up to 3 years experience)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$20.75
Supplemental Benefit Rate per Hour: \$12.30

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Groundperson

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$20.75

Supplemental Benefit Rate per Hour: \$12.30

Tree Remover / Pruner

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$29.25

Supplemental Benefit Rate per Hour: \$12.30

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$19.25

Supplemental Benefit Rate per Hour: \$12.30

Watering - Plant Maintainer

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$14.25

Supplemental Benefit Rate per Hour: \$12.30

Overtime Description

For all overtime work performed, supplemental benefits shall include an additional seventy-five (\$0.75) cents per hour.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Shift Rates

Work performed on a 4pm to 12am shift has a 15% differential. Work performed on a 12am to 8am shift has a 20% differential.

(Local #175)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$49.19**
Supplemental Benefit Rate per Hour: **\$32.24**

Marble Finisher

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$39.05**
Supplemental Benefit Rate per Hour: **\$31.43**

Marble Polisher

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: **\$34.73**
Supplemental Benefit Rate per Hour: **\$24.60**

Overtime Description

Supplemental Benefit contributions are to be made at the applicable overtime rates. Time and one half the regular rate after a 7 hour day or time and one half the regular rate after an 8 hour day - chosen by Employer at the start of the project and then would last for the full duration of the project.

Overtime

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Local #7)

MASON TENDER

Mason Tender

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$34.24**

Supplemental Benefit Rate per Hour: **\$24.40**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$34.50**

Supplemental Benefit Rate per Hour: **\$25.14**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

The Employer may work two (2) shifts with the first shift at the straight time wage rate and the second shift receiving eight (8) hours paid for seven (7) hours work at the straight time wage rate.

(Local #79)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

MASON TENDER (INTERIOR DEMOLITION WORKER)

(The erection, building, moving, servicing and dismantling of enclosures, scaffolding, barricades, protection and site safety structures etc., on Interior Demolition jobs.)

Mason Tender Tier A

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$33.87**

Supplemental Benefit Rate per Hour: **\$19.22**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$34.07**

Supplemental Benefit Rate per Hour: **\$19.77**

Mason Tender Tier B

On Interior Demolition job sites 33 1/3 % of the employees shall be classified as Tier A Interior Demolition Workers and 66 2/3 % shall be classified as Tier B Interior Demolition Workers; provided that the employer may employ more than 33 1/3 % Tier A Interior Demolition Workers on the job site. Where the number of employees on a job site is not divisible by 3, the first additional employee (above the number of employees divisible by three) shall be a Tier B Interior Demolition Worker, and the second additional employee shall be a Tier A Interior Demolition Worker.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$23.07**

Supplemental Benefit Rate per Hour: **\$13.53**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$23.27**

Supplemental Benefit Rate per Hour: **\$14.08**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$41.23

Supplemental Benefit Rate per Hour: \$38.35

Supplemental Note: Supplemental benefits for overtime are paid at the appropriate overtime rate.

Overtime Description

Overtime would be time and one half the regular rate after a seven (7) or eight (8) hours workday, which would be set at the start of the job.

Overtime

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

There shall be either two (2) or three (3) shifts, each shift shall be eight (8) hours with nine (9) hours pay, including one half (1/2) hour for lunch. Off-Hour Start shall commence after 3:30 P.M. and shall conclude by 6:00 A.M. The first consecutive seven (7) hours shall be at straight time with a differential of twelve dollars (\$12.00) per hour. Fringes shall be paid at the straight time rate.

(Local #46)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

MILLWRIGHT

Millwright

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$46.19

Supplemental Benefit Rate per Hour: \$45.67

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

The first shift shall receive the straight time rate of pay. The second shift receives the straight time rate of pay plus fifteen (15%) per cent. Members of the second shift shall be allowed one half hour to eat, with this time being included in the hours of the workday established. There must be a first shift to work a second shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) per cent for weekday hours.

(Local #740)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2012 - 12/31/2012

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$43.93

Supplemental Benefit Rate per Hour: \$33.08

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$44.05 per hour.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$44.39

Supplemental Benefit Rate per Hour: \$35.12

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.09 per hour.

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$42.36

Supplemental Benefit Rate per Hour: \$33.08

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$44.05 per hour.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$42.78

Supplemental Benefit Rate per Hour: \$35.11

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.08 per hour.

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$42.36

Supplemental Benefit Rate per Hour: \$33.08

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$44.05 per hour.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$42.78

Supplemental Benefit Rate per Hour: \$35.11

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.08 per hour.

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Good Friday

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Paid Holidays

None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: \$35.50

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Effective Period: 11/1/2012 - 4/30/2013

Wage Rate per Hour: \$36.00

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Effective Period: 5/1/2013 - 6/30/2013

Wage Rate per Hour: \$37.50

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: \$38.50

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Effective Period: 11/1/2012 - 4/30/2013

Wage Rate per Hour: \$39.00

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Effective Period: 5/1/2013 - 6/30/2013

Wage Rate per Hour: \$40.50

Supplemental Benefit Rate per Hour: \$25.12

Supplemental Note: \$29.75 on overtime

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

(District Council of Painters #9)

PAINTER - SIGN

Designer

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$36.15

Supplemental Benefit Rate per Hour: \$9.66

Journey person

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$33.62

Supplemental Benefit Rate per Hour: \$9.66

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Christmas Day

Shift Rates

All work performed outside the regular 8 hour work day (either 7:00 A.M to 3:30 P.M or 8:00 A.M. to 4:30 P.M) shall be paid at time and one half the regular hourly rate.

(Local #8A-28A)

PAINTER - STRIPER

Striper (paint)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$33.00

Supplemental Benefit Rate per Hour: \$11.52

Supplemental Note: Overtime Supplemental Benefit rate - \$7.42; New Hire Rate (0-3 months) - \$0.00

Lineperson (thermoplastic)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.00

Supplemental Benefit Rate per Hour: \$11.52

Supplemental Note: Overtime Supplemental Benefit rate - \$7.42; New Hire Rate (0-3 months) - \$0.00

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

Employees hired before April 1, 2003: 15% night shift premium differential for work commenced at 9:00 PM or later.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Vacation

Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation. Vacation must be taken during winter months. 2 Personal Days except employees hired after 4/1/12 who do not have 2 years of service.

(Local #917)

PAINTER - STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2012 - 9/30/2012

Wage Rate per Hour: **\$46.25**

Supplemental Benefit Rate per Hour: **\$31.58**

Effective Period: 10/1/2012 - 6/30/2013

Wage Rate per Hour: **\$47.00**

Supplemental Benefit Rate per Hour: **\$32.08**

Painter - Power Tool

Effective Period: 7/1/2012 - 9/30/2012

Wage Rate per Hour: **\$52.25**

Supplemental Benefit Rate per Hour: **\$31.58**

Effective Period: 10/1/2012 - 6/30/2013

Wage Rate per Hour: **\$53.00**

Supplemental Benefit Rate per Hour: **\$32.08**

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Paid Holidays

None

Shift Rates

Regular hourly rates plus a ten per cent (10%) differential

(Local #806)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2012 - 4/30/2013

Wage Rate per Hour: **\$37.44**

Supplemental Benefit Rate per Hour: **\$29.23**

Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Effective Period: 5/1/2013 - 6/30/2013

Wage Rate per Hour: **\$39.00**

Supplemental Benefit Rate per Hour: **\$29.23**

Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

Shift Rates

Evening shift - 4:30 P.M. to 12:00 Midnight (regular rate of pay); any work performed before 7:00 A.M. shall be at time and one half the regular base rate of pay.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(District Council of Painters #9)

PAVER AND ROADBUILDER

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$42.86

Supplemental Benefit Rate per Hour: \$32.15

Paver & Roadbuilder - Laborer

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work before the installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry seal coating, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.99

Supplemental Benefit Rate per Hour: \$32.15

Production Paver & Roadbuilder - Screed Person

(Production paving is asphalt paving when using a paving machine or on a project where a paving machine is traditionally used)

Adjustment of paving machinery on production paving jobs.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$45.00

Supplemental Benefit Rate per Hour: \$32.15

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$44.49

Supplemental Benefit Rate per Hour: \$32.15

Production Paver & Roadbuilder - Shoveler

General laborer (except removal of surfaces - see Paver and Roadbuilder-Laborer) including but not limited to tamper, AC paint and liquid tar work.

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$41.20

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$32.15

Overtime Description

Veteran's Day is a Paid Holiday for employees working on production paving.

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 15%, except if an employee works on production paving on New Year's Day or Christmas Day, they receive the single time rate plus one day's pay for the holiday worked.

Employees who work on a holiday listed below receive the straight time rate plus one day's pay for the holiday.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Paid Holidays

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Thanksgiving Day

Shift Rates

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours since only one half (1/2) hour is allowed for meal time.

When two or more shifts are employed, single time will be paid for each shift.

Night Work - On night work, the first eight (8) hours of work will be paid for at fifteen percent (15%) over the single time rate, except that production paving work shall be paid at 25% over the single time rate. Hours worked over eight (8) hours during said shift shall be paid for at the time and one-half rate.

(Local #1010)

PLASTERER

Plasterer

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$40.78

Supplemental Benefit Rate per Hour: \$26.80

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$40.78

Supplemental Benefit Rate per Hour: \$27.55

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

When it is not possible to conduct alteration work during regular work hours, in a building occupied by tenants, said work shall proceed on a shift basis: however work over seven (7) hours in any twenty-four (24) hour period, the time after seven (7) hours shall be considered overtime.

The second shift shall start at a time between 3:30 p.m. and 7:00 p.m. and shall consist of seven (7) working hours and shall receive eight (8) hours of wages and benefits at the straight time rate. The workers on the second shift shall be allowed one-half (1/2) hour to eat with this time being included in the seven (7) hours of work.

(Local #530)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$34.24

Supplemental Benefit Rate per Hour: \$24.40

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$34.50

Supplemental Benefit Rate per Hour: \$25.14

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§220 PREVAILING WAGE SCHEDULE

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

When work commences outside regular work hours, workers receive an hour additional (differential) wage and supplement payment. Eight hours pay for seven hours work or nine hours pay for eight hours work.

(Mason Tenders District Council)

PLUMBER

Plumber

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$51.76

Supplemental Benefit Rate per Hour: \$37.19

Supplemental Note: Overtime supplemental benefit rate per hour: \$74.10

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$52.36

Supplemental Benefit Rate per Hour: \$37.34

Supplemental Note: Overtime supplemental benefit rate per hour: \$74.40

Overtime Description

Double time the regular rate after a 7 hour day - unless for new construction site work where the plumbing contract price is \$1 million or less, and for public works jobs where the plumbing contract is \$1.5 million or less, the hours of labor can be 8 hours per day at the employers option. On Alteration jobs when other mechanical

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

trades at the site are working an eighth hour at straight time, then the plumber shall also work an eighth hour at straight time.

Overtime

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

Shift work, when directly specified in public agency or authority documents where plumbing contract is \$8 million or less, will be permitted. 30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday. 50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER (MECHANICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$32.96

Supplemental Benefit Rate per Hour: \$15.93

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$33.21

Supplemental Benefit Rate per Hour: \$16.43

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

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§220 PREVAILING WAGE SCHEDULE

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$36.69

Supplemental Benefit Rate per Hour: \$25.46

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$37.11

Supplemental Benefit Rate per Hour: \$25.56

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Shift Rates

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday.
50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

**PLUMBER: PUMP & TANK
(Installation and Maintenance)**

Plumber - Pump & Tank

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$52.81

Supplemental Benefit Rate per Hour: \$31.56

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER - WATERPROOFER, CAULKER MECHANIC (EXTERIOR BUILDING RENOVATION)

Pointer - Waterproofer, Caulker Mechanic

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$44.63**

Supplemental Benefit Rate per Hour: **\$23.10**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:30 P.M.) is to be paid at time and one half the regular rate.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$38.00**

Supplemental Benefit Rate per Hour: **\$27.07**

Effective Period: 1/1/2013 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$39.00**

Supplemental Benefit Rate per Hour: **\$27.37**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential.

(Local #8)

SANDBLASTER - STEAMBLASTER
(Exterior Building Renovation)

Sandblaster / Steamblaster

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$44.63**

Supplemental Benefit Rate per Hour: **\$23.10**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

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\$220 PREVAILING WAGE SCHEDULE

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:30 P.M.) is to be paid at time and one half the regular rate.

(Bricklayer District Council)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$45.65

Supplemental Benefit Rate per Hour: \$40.50

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$45.65

Supplemental Benefit Rate per Hour: \$42.00

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$12.90

Supplemental Benefit Rate per Hour: \$8.07

Sheet Metal Worker - Fan Maintenance

(The temporary operation of fans or blowers in new or existing buildings for heating and/or ventilation, and/or air conditioning prior to the completion of the project.)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$36.52

Supplemental Benefit Rate per Hour: \$40.50

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\$220 PREVAILING WAGE SCHEDULE

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$36.52

Supplemental Benefit Rate per Hour: \$42.00

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

Shift Rates

Work that can only be performed outside regular working hours (seven hours of work between 7:30 A.M. and 3:30

P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate.

Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays. No journey person engaged in fan maintenance shall work in excess of forty (40) hours in any work week.

(Local #28)

SHEET METAL WORKER - SPECIALTY (Decking & Siding)

Sheet Metal Specialty Worker

The first worker to perform this work must be paid at the rate of the Sheet Metal Worker. The second and third workers shall be paid the Specialty Worker Rate. The ratio of One Sheet Metal Worker, then Two Specialty Workers shall be utilized thereafter.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$40.09

Supplemental Benefit Rate per Hour: \$22.06

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

(Local #28)

SIGN ERECTOR

(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$41.55

Supplemental Benefit Rate per Hour: \$39.32

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$42.80

Supplemental Benefit Rate per Hour: \$42.17

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter I

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$50.75**

Supplemental Benefit Rate per Hour: **\$49.68**

Supplemental Note: Overtime supplemental benefit rate: **\$98.62**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$51.25**

Supplemental Benefit Rate per Hour: **\$50.54**

Supplemental Note: Overtime supplemental benefit rate: **\$100.34**

Overtime

Double time the regular rate after a 7 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

Work performed between 3:30 P.M. and 7:00 A.M. and on Saturdays, Sundays and Holidays shall be at double time the regular hourly rate and paid at the overtime supplemental benefit rate above.

Steamfitter II

For heating, ventilation, air conditioning and mechanical public works contracts with a dollar value not to exceed \$15,000,000 and for fire protection/sprinkler public works contracts not to exceed \$1,500,000.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$50.75

Supplemental Benefit Rate per Hour: \$49.68

Supplemental Note: Overtime supplemental benefit rate: \$98.62

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$51.25

Supplemental Benefit Rate per Hour: \$50.54

Supplemental Note: Overtime supplemental benefit rate: \$100.34

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

None

Shift Rates

May be performed outside of the regular workday except Saturday, Sunday and Holidays. A shift shall consist of eight working hours. All work performed in excess of eight hours shall be paid at double time. No shift shall commence after 7:00 P.M. on Friday or 7:00 P.M. the day before holidays. All work performed after 12:01 A.M. Saturday or 12:01 A.M. the day before a Holiday will be paid at double time. When shift work is performed the wage rate for regular time worked is a thirty percent premium together with fringe benefits.

On Transit Authority projects, where work is performed in the vicinity of tracks all shift work on weekends and holidays may be performed at the regular shift rates.

Local #638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER (Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$36.30**

Supplemental Benefit Rate per Hour: **\$11.76**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$37.05**

Supplemental Benefit Rate per Hour: **\$12.26**

Refrigeration and Air Conditioner Service Person V (4th year)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$29.82**

Supplemental Benefit Rate per Hour: **\$10.71**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$30.44**

Supplemental Benefit Rate per Hour: **\$11.13**

Refrigeration and Air Conditioner Service Person IV (3rd year)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$24.71**

Supplemental Benefit Rate per Hour: **\$9.80**

Effective Period: 1/1/2013 - 6/30/2013

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\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$25.22

Supplemental Benefit Rate per Hour: \$10.16

Refrigeration and Air Conditioner Service Person III (2nd year)

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$21.21

Supplemental Benefit Rate per Hour: \$9.12

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$21.65

Supplemental Benefit Rate per Hour: \$9.44

Refrigeration and Air Conditioner Service Person II (2nd six months)

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$17.60

Supplemental Benefit Rate per Hour: \$8.50

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$17.96

Supplemental Benefit Rate per Hour: \$8.78

Refrigeration and Air Conditioner Service Person I (1st six months)

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$10.95

Supplemental Benefit Rate per Hour: \$7.90

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$11.18

Supplemental Benefit Rate per Hour: \$8.10

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

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§220 PREVAILING WAGE SCHEDULE

Double time the regular rate for work on the following holiday(s).

New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).

Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #638B)

STONE MASON - SETTER

Stone Mason - Setters

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$47.72

Supplemental Benefit Rate per Hour: \$35.28

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates

For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2012 - 12/25/2012

Wage Rate per Hour: **\$43.32**

Supplemental Benefit Rate per Hour: **\$21.66**

Effective Period: 12/26/2012 - 6/30/2013

Wage Rate per Hour: **\$43.82**

Supplemental Benefit Rate per Hour: **\$21.66**

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Christmas Day

Paid Holidays

Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Shift Rates

Time and one half the regular rate outside the regular work hours (8:00 A.M. through 3:30 P.M.)

(Local #1974)

**TELECOMMUNICATION WORKER
(Voice Installation Only)**

Telecommunication Worker

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$35.94

Supplemental Benefit Rate per Hour: \$13.19

Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. \$12.64 for Staten Island only.

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Lincoln's Birthday

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

Paid Holidays

New Year's Day

Lincoln's Birthday

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$38.17

Supplemental Benefit Rate per Hour: \$26.76

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$38.49

Supplemental Benefit Rate per Hour: \$27.42

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TILE LAYER - SETTER

Tile Layer - Setter

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$47.75

Supplemental Benefit Rate per Hour: \$30.83

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$48.55

Supplemental Benefit Rate per Hour: \$31.46

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

TIMBERPERSON

Timberperson

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$42.63

Supplemental Benefit Rate per Hour: \$41.99

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

Off shift work, commencing between 5:00 P.M. and 10:00 P.M., shall work eight and one half hours but will be paid for 9 hours, including benefits at the straight time rate for 8 hours.

(Local #1536)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$52.00

Supplemental Benefit Rate per Hour: \$46.85

Tunnel Workers (Compressed Air Rates)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$50.19

Supplemental Benefit Rate per Hour: \$45.29

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$49.27

Supplemental Benefit Rate per Hour: \$44.51

Outside Lock Tender, Outside Gauge Tender, Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$48.37

Supplemental Benefit Rate per Hour: \$43.67

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$48.37

Supplemental Benefit Rate per Hour: \$43.67

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$42.09

Supplemental Benefit Rate per Hour: \$41.41

Blasters (Free Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$49.62

Supplemental Benefit Rate per Hour: \$44.75

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$47.48

Supplemental Benefit Rate per Hour: \$42.84

All Others (Free Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$43.87

Supplemental Benefit Rate per Hour: \$39.62

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Microtunneling (Free Air Rates)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.98

Supplemental Benefit Rate per Hour: \$34.27

Overtime Description

For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, or for Saturday, or for Sunday. Double time the regular rate for work on a holiday.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

(Local #147)

WELDER

**TO BE PAID AT THE RATE OF THE JOURNEYPERSON IN THE TRADE
PERFORMING THE WORK.**

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OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

APPENDIX

Pursuant to Labor Law §220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be employed on a public work project.

Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the journey person wage rate for the classification of work he actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

APPRENTICESHIP SCHEDULE OF PREVAILING WAGES AND SUPPLEMENTAL BENEFITS
ADDENDUM
EFFECTIVE PERIOD JANUARY 1, 2013 THROUGH JUNE 30, 2013

List of Amended Classifications

1. Boilermaker
2. House Wrecker
3. Iron Worker - Ornamental
4. Iron Worker - Structural
5. Mason Tender
6. Plasterer
7. Plumber

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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

ASBESTOS HANDLER

(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Asbestos Handler (First 1000 Hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 78% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$14.85

Asbestos Handler (Second 1000 Hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$14.85

Asbestos Handler (Third 1000 Hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 83% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$14.85

Asbestos Handler (Fourth 1000 Hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 89% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$14.85

(Local #78)

BOILERMAKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$27.41

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$28.45

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate Per Hour: \$28.75

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$28.91

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$30.03

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$30.33

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$30.40

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$31.61

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$31.91

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$31.89

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$33.19

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$33.49

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 85% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$33.38

Effective Period: 1/1/2013 - 3/31/2013

Wage Rate Per Hour: 85% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$34.76

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 4/1/2013 - 6/30/2013
Wage Rate Per Hour: 85% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$35.06

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$34.88

Effective Period: 1/1/2013 - 3/31/2013
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$36.34

Effective Period: 4/1/2013 - 6/30/2013
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$36.64

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 95% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$36.38

Effective Period: 1/1/2013 - 3/31/2013
Wage Rate Per Hour: 95% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$37.90

Effective Period: 4/1/2013 - 6/30/2013
Wage Rate Per Hour: 95% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$38.20

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

(Bricklayer District Council)

CARPENTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$27.69

Carpenter (Second Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$27.69

Carpenter (Third Year)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$27.69

Carpenter (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$27.69

(Carpenters District Council)

CEMENT MASON

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 50% of Journeyman's Rate

Cement Mason (Second Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 60% of Journeyman's Rate

Cement Mason (Third Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 70% of Journeyman's Rate

(Local #780)

CEMENT AND CONCRETE WORKER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Cement & Concrete Worker (0 - 500 hours)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.54

Cement & Concrete Worker (501 - 1000 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$18.37

Cement & Concrete Worker (1001 - 2000 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.75

Cement & Concrete Worker (2001 - 4000 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$24.57

(Cement Concrete Workers District Council)

**DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)**

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: 50% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 90% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

(Local #197)

DOCKBUILDER/PILE DRIVER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$27.69

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$27.69

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$27.69

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$27.69

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Year - Hired before 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$14.25

Supplemental Benefit Rate per Hour: \$11.19

Overtime Wage Rate Per Hour: \$21.38

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Overtime Supplemental Rate Per Hour: \$11.96

Electrician (First Year - Hired on or After 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$11.50

Supplemental Benefit Rate per Hour: \$9.86

Overtime Wage Rate Per Hour: \$17.25

Overtime Supplemental Rate Per Hour: \$10.48

Electrician (Second Year - Hired before 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$17.05

Supplemental Benefit Rate per Hour: \$12.54

Overtime Wage Rate Per Hour: \$25.58

Overtime Supplemental Rate Per Hour: \$13.47

Electrician (Second Year - Hired on or After 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$13.50

Supplemental Benefit Rate per Hour: \$10.83

Overtime Wage Rate Per Hour: \$20.25

Overtime Supplemental Rate Per Hour: \$11.56

Electrician (Third Year - Hired before 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$19.15

Supplemental Benefit Rate per Hour: \$13.56

Overtime Wage Rate Per Hour: \$28.73

Overtime Supplemental Rate Per Hour: \$14.60

Electrician (Third Year - Hired on or After 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$15.50

Supplemental Benefit Rate per Hour: \$11.79

Overtime Wage Rate Per Hour: \$23.25

Overtime Supplemental Rate Per Hour: \$12.63

Electrician (Fourth Year - Hired before 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$21.10

Supplemental Benefit Rate per Hour: \$14.50

Overtime Wage Rate Per Hour: \$31.65

Overtime Supplemental Rate Per Hour: \$15.65

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Electrician (Fourth Year - Hired on or After 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$17.50

Supplemental Benefit Rate per Hour: \$12.76

Overtime Wage Rate Per Hour: \$26.25

Overtime Supplemental Rate Per Hour: \$13.71

Electrician (Fifth Year - Hired before 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$25.30

Supplemental Benefit Rate per Hour: \$17.52

Overtime Wage Rate Per Hour: \$37.95

Overtime Supplemental Rate Per Hour: \$18.85

Electrician (Fifth Year - Hired on or After 5/10/07)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$21.50

Supplemental Benefit Rate per Hour: \$15.71

Overtime Wage Rate Per Hour: \$32.25

Overtime Supplemental Rate Per Hour: \$16.84

Overtime Description

For "A" rated Apprentices (work in excess of 7 hours per day)

For "M" rated Apprentices (work in excess of 8 hours per day)

(Local #3)

ELEVATOR CONSTRUCTOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$25.40

Effective 3/17/2013 - Supplemental Rate Per Hour: \$26.87

Elevator (Constructor) - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 55% of Journeyperson's rate

Supplemental Rate Per Hour: \$26.43

Effective 3/17/2013 - Supplemental Rate Per Hour: \$27.92

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Elevator (Constructor) - Third Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$27.84
Effective 3/17/2013 - Supplemental Rate Per Hour: \$29.38

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: \$29.25
Effective 3/17/2013 - Supplemental Benefit Per Hour: \$30.84

(Local #1)

ELEVATOR REPAIR & MAINTENANCE
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: \$25.33
Effective 3/17/2013 - Supplemental Benefit Per Hour: \$26.79

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: \$25.65
Effective 3/17/2013 - Supplemental Benefit Per Hour: \$27.12

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: \$26.92
Effective 3/17/2013 - Supplemental Benefit Per Hour: \$28.43

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: \$28.19

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective 3/17/2013 - Supplemental Benefit Per Hour: \$29.74

(Local #1)

ENGINEER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$21.64

Supplemental Benefit Rate per Hour: \$20.07

Engineer - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$27.05

Supplemental Benefit Rate per Hour: \$20.07

Engineer - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$29.75

Supplemental Benefit Rate per Hour: \$20.07

Engineer - Fourth Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$32.45

Supplemental Benefit Rate per Hour: \$20.07

(Local #15)

ENGINEER - OPERATING

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour 40% of Journeyperson's Rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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Supplemental Benefit Per Hour: \$18.65

Operating Engineer - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's Rate

Supplemental Benefit Per Hour: \$18.65

Operating Engineer - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 60% of Journeyperson's Rate

Supplemental Benefit Per Hour: \$18.65

(Local #14)

FLOOR COVERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Second Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Third Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: \$25.75

(Carpenters District Council)

GLAZIER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$11.97

Glazier (Second Year)

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$21.01

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$21.13

Glazier (Third Year)

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate Per Hour: 60% of Journeyman's rate

Supplemental Rate Per Hour: \$23.38

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$23.54

Glazier (Fourth Year)

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Rate Per Hour: \$28.14

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$28.34

(Local #1281)

HEAT & FROST INSULATOR

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 70% of Journeyman's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #12)

**HOUSE WRECKER
(TOTAL DEMOLITION)**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$20.06

Supplemental Benefit Rate per Hour: \$15.45

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$20.21

Supplemental Benefit Rate per Hour: \$15.80

House Wrecker - Second Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$21.06

Supplemental Benefit Rate per Hour: \$15.45

Effective Period: 1/1/2013 - 6/30/2013

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Wage Rate per Hour: \$21.26
Supplemental Benefit Rate per Hour: \$15.80

House Wrecker - Third Year

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$22.56
Supplemental Benefit Rate per Hour: \$15.45

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$22.81
Supplemental Benefit Rate per Hour: \$15.80

House Wrecker - Fourth Year

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$25.06
Supplemental Benefit Rate per Hour: \$15.45

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$25.36
Supplemental Benefit Rate per Hour: \$15.80

(Local #79)

IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - 1st Four Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$32.06

Iron Worker (Ornamental) 5 - 10 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$32.89

Iron Worker (Ornamental) 11 - 16 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$33.73

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Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$34.34

Iron Worker (Ornamental) 17 - 22 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Rate Per Hour: \$35.39

Iron Worker (Ornamental) 23 - 28 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 85% of Journeyman's rate
Supplemental Rate Per Hour: \$36.22

Iron Worker (Ornamental) 29 - 36 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 95% of Journeyman's rate
Supplemental Rate Per Hour: \$37.89

Iron Worker (Ornamental) - 1st Ten Months - Hired After 8/1/08

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$30.40

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$33.39

Iron Worker (Ornamental) - 11 - 16 Months - Hired After 8/1/08

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$31.23

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$34.34

Iron Worker (Ornamental) - 17 - 22 Months - Hired After 8/1/08

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$32.06

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$35.29

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Iron Worker (Ornamental) - 23 - 28 Months - Hired After 8/1/08

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Rate Per Hour: \$33.73

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Rate Per Hour: \$37.19

Iron Worker (Ornamental) - 29 - 36 Months - Hired After 8/1/08

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: \$35.39

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: \$39.09

(Local #580)

IRON WORKER - STRUCTURAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$23.62

Supplemental Benefit Rate per Hour: \$41.21

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$24.10

Supplemental Benefit Rate per Hour: \$43.12

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$24.22

Supplemental Benefit Rate per Hour: \$41.21

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$24.70

Supplemental Benefit Rate per Hour: \$43.12

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$24.82

Supplemental Benefit Rate per Hour: \$41.21

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$25.30

Supplemental Benefit Rate per Hour: \$43.12

(Local #40 and #361)

LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE LAYER & COMMON)

(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First 1000 hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.75

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Second 1000 hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 60% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.75

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Third 1000 hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.75

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Fourth 1000 hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 90% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.75

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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(Local #731)

MARBLE MECHANICS

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Polishers & Finishers - Third 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Polishers & Finishers - Fourth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

MASON TENDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$20.33

Supplemental Benefit Rate per Hour: \$16.16

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$20.48

Supplemental Benefit Rate per Hour: \$16.51

Mason Tender - Second Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$21.33

Supplemental Benefit Rate per Hour: \$16.16

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$21.53

Supplemental Benefit Rate per Hour: \$16.51

Mason Tender - Third Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$22.83

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Supplemental Benefit Rate per Hour: \$16.16

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$23.08

Supplemental Benefit Rate per Hour: \$16.51

Mason Tender - Fourth Year

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$25.33

Supplemental Benefit Rate per Hour: \$16.16

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$25.63

Supplemental Benefit Rate per Hour: \$16.51

(Local #79)

METALLIC LATHER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year -Called Prior to 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$27.91

Supplemental Benefit Rate per Hour: \$22.79

Metallic Lather (Second Year - Called Prior to 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$32.51

Supplemental Benefit Rate per Hour: \$24.44

Metallic Lather (Third Year - Called Prior to 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$37.57

Supplemental Benefit Rate per Hour: \$25.59

Metallic Lather (First Year -Called On Or After 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$17.71

Supplemental Benefit Rate per Hour: \$19.85

Metallic Lather (Second Year - Called On Or After 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$22.71

Supplemental Benefit Rate per Hour: \$19.85

Metallic Lather (Third Year - Called On Or After 6/29/11)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$27.71

Supplemental Benefit Rate per Hour: \$19.85

(Local #46)

MILLWRIGHT

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$25.40

Supplemental Benefit Rate per Hour: \$28.67

Millwright (Second Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$30.02

Supplemental Benefit Rate per Hour: \$31.87

Millwright (Third Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$34.64

Supplemental Benefit Rate per Hour: \$36.19

Millwright (Fourth Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$43.88

Supplemental Benefit Rate per Hour: \$41.50

(Local #740)

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PAVER AND ROADBUILDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$25.72**

Supplemental Benefit Rate per Hour: **\$15.75**

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$27.29**

Supplemental Benefit Rate per Hour: **\$15.75**

(Local #1010)

PAINTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: **\$14.20**

Supplemental Benefit Rate per Hour: **\$10.88**

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate per Hour: **\$14.40**

Supplemental Benefit Rate per Hour: **\$10.88**

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: **\$17.75**

Supplemental Benefit Rate per Hour: **\$14.73**

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate per Hour: **\$18.00**

Supplemental Benefit Rate per Hour: **\$14.73**

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: \$21.30

Supplemental Benefit Rate per Hour: \$17.64

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate per Hour: \$21.60

Supplemental Benefit Rate per Hour: \$17.64

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2012 - 10/31/2012

Wage Rate per Hour: \$28.40

Supplemental Benefit Rate per Hour: \$23.02

Effective Period: 11/1/2012 - 6/30/2013

Wage Rate per Hour: \$28.80

Supplemental Benefit Rate per Hour: \$23.02

(District Council of Painters)

PAINTER - STRUCTURAL STEEL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #806)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

PLASTERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer - First Year: 1st Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: \$14.61

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: \$15.36

Plasterer - First Year: 2nd Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: \$15.09

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: \$15.84

Plasterer - Second Year: 1st Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: \$17.06

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: \$17.81

Plasterer - Second Year: 2nd Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$18.14

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$18.89

Plasterer - Third Year: 1st Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$20.31

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Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$21.06

Plasterer - Third Year: 2nd Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$21.39

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$22.14

(Local #530)

PLUMBER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$14.00
Supplemental Benefit Rate per Hour: \$0.71

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate per Hour: \$14.00
Supplemental Benefit Rate per Hour: \$2.96

Plumber - Second Year

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$17.96
Supplemental Benefit Rate per Hour: \$16.25

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$18.26
Supplemental Benefit Rate per Hour: \$16.32

Plumber - Third Year

Effective Period: 7/1/2012 - 12/31/2012

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Wage Rate per Hour: \$20.06
Supplemental Benefit Rate per Hour: \$16.25

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$20.36
Supplemental Benefit Rate per Hour: \$16.32

Plumber - Fourth Year

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$22.91
Supplemental Benefit Rate per Hour: \$16.25

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$23.21
Supplemental Benefit Rate per Hour: \$16.32

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$24.31
Supplemental Benefit Rate per Hour: \$16.25

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$24.61
Supplemental Benefit Rate per Hour: \$16.32

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$36.38
Supplemental Benefit Rate per Hour: \$16.25

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$36.68
Supplemental Benefit Rate per Hour: \$16.32

(Plumbers Local #1)

POINTER - WATERPROOFER, CAULKER MECHANIC (EXTERIOR BUILDING RENOVATION)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Pointer - Waterproofer, Caulker Mechanic - First Year

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\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$25.00

Supplemental Benefit Rate per Hour: \$3.45

Pointer - Waterproofor, Caulker Mechanic - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$27.25

Supplemental Benefit Rate per Hour: \$8.40

Pointer - Waterproofor, Caulker Mechanic - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$32.23

Supplemental Benefit Rate per Hour: \$11.15

Pointer - Waterproofor, Caulker Mechanic - Fourth Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$38.66

Supplemental Benefit Rate per Hour: \$11.15

(Bricklayer District Council)

ROOFER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 35% of Journeyperson's Rate

Roofer - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Roofer - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Roofer - Fourth Year

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Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 75% of Journeyman's Rate

(Local #8)

SHEET METAL WORKER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Sheet Metal Worker - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 30% of Journeyman's rate

Supplemental Rate Per Hour: \$15.37

Sheet Metal Worker - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 35% of Journeyman's rate

Supplemental Rate Per Hour: \$18.24

Sheet Metal Worker - Third Year (1st Six Months)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$20.06

Sheet Metal Worker - Third Year (2nd Six Months)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 45% of Journeyman's rate

Supplemental Rate Per Hour: \$21.87

Sheet Metal Worker - Fourth Year (1st Six Months)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$23.69

Sheet Metal Worker - Fourth Year (2nd Six Months)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 55% of Journeyman's rate

Supplemental Rate Per Hour: \$25.33

Sheet Metal Worker - Fifth Year (1st Six Months)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$27.47

Sheet Metal Worker - Fifth Year(2nd Six Months)

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$31.23

(Local #28)

SIGN ERECTOR

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 35% of Journeyman's rate
Supplemental Rate Per Hour: \$5.96

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 40% of Journeyman's rate
Supplemental Rate Per Hour: \$6.75

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 45% of Journeyman's rate
Supplemental Rate Per Hour: \$7.55

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$8.34

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$9.13

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$9.92

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$10.72

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$11.51

Sign Erector - Fifth Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: \$12.30

Sign Erector - Sixth Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$12.30

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate and Supplemental Rate per Hour: 65% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate and Supplemental Rate Per Hour: 85% of Journeyperson's rate.

(Local #638)

STONE MASON - SETTER

(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 60% of Journeyperson's rate

Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013
Wage Rate Per Hour: 100% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

TAPER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Drywall Taper - Second Year

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Drywall Taper - Third Year

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1974)

TILE LAYER - SETTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2012 - 6/30/2013
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2012 - 6/30/2013

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

(Local #7)

TIMBERPERSON

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Rate Per Hour: \$27.49

Timberperson - Second Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$27.49

Timberperson - Third Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Rate Per Hour: \$27.49

Timberperson - Fourth Year

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: \$27.49

(Local #1536)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

LABOR LAW § 230 AND NYC ADMINISTRATIVE CODE § 6-130
BUILDING SERVICE EMPLOYEES

PREVAILING WAGE FOR BUILDING SERVICE EMPLOYEES ON NYC CONTRACTS PURSUANT TO
LABOR LAW § 230 ET SEQ.

Building service employees on public contracts must receive not less than the prevailing rate of wage and supplements for the classification of work performed. In accordance with Labor Law §230 et seq. the Comptroller of the City of New York has promulgated this schedule of prevailing wages and supplemental benefits for building service employees engaged on New York City public building service contracts in excess of \$1,500.00. Prevailing rates are required to be annexed to and form part of the contract pursuant to §231 (4).

Contracting agencies that anticipate doing work that may require building service trades or classifications not included in this schedule may request the Comptroller to establish a proper classification and wage determination for the work. Contractors using trades and/or classifications for which the Comptroller has not promulgated wages and benefits do so at their own risk.

Contractors are advised to review the applicable Comptroller's Prevailing Wage Schedule before bidding on public work. Any Prevailing Wage Rate error made by the Contracting Agency, whether in a contract document or other communication, will not preclude a finding against the contractor of a prevailing-wage violation.

PREVAILING WAGE FOR BUILDING SERVICE EMPLOYEES IN NEW YORK CITY LEASED OR
FINANCIALLY ASSISTED FACILITIES PURSUANT TO NYC ADMINISTRATIVE CODE § 6-130

Covered landlords & covered financial assistance recipients shall ensure that all building service employees performing building service work at the premises to which a lease or financial assistance pertains are paid no less than the prevailing wage listed in the Labor Law §230 Prevailing Wage Schedule.

Covered Landlords include:

Businesses (other than not-for-profit organizations) leasing to New York City agencies commercial office space or commercial office facilities of 10,000 square feet or more where the City leases or rents no less than 51% of the total square footage of the building to which the lease applies (no less than 80% in Staten Island or in an area not defined as an exclusion area pursuant to section 421-a of the real property tax law on the date of enactment of the local law).

Covered Financial Assistance Recipients include:

Businesses (other than not-for-profit organizations) with annual gross revenues of five million dollars or more who have received financial assistance from the City of New York (as defined in New York City Administrative Code §6-130) with a total value of one million dollars or more.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Exemptions: Business Improvement Districts and employers with manufacturing operations at the premises to which the financial assistance pertains.

The information is intended to assist you in meeting your prevailing wage obligation. You should consult New York City Administrative Code §6-130 to determine whether you are covered by this prevailing wage law. New York City Administrative Code § 6-130 requires the City to maintain an updated list of covered landlords and financial assistance recipients who are subject to the prevailing wage requirement.

Labor Law § 231 (6) and NYC Administrative Law §6-130 require contractors to post on the site of the work a current copy of this schedule of wages and supplements.

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site www.comptroller.nyc.gov. Contractors must pay the wages and supplements in effect when the building service employee performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site www.comptroller.nyc.gov.

Contractors are solely responsible for maintaining original payroll records delineating, among other things, the hours worked by each employee within a given classification.

Some of the rates in this schedule are based on collective bargaining agreements. The Comptroller's Office has attempted to include all overtime, shift and night differential, Holiday, Saturday, Sunday or other premium time work. However, this schedule does not set forth every prevailing practice with respect to such rates with which employers must comply. All such practices are nevertheless part of the employer's prevailing wage obligation and contained in the collective bargaining agreements of the prevailing wage unions. These collective bargaining agreements are available for inspection by appointment. Requests for appointments may be made by calling (212) 669-4443, Monday through Friday between the hours of 9 a.m. and 5 p.m.

Answers to questions concerning prevailing trade practices may be obtained from the Classification Unit by calling (212) 669-7974. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasyl Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 1122, New York, N.Y. 10007; Fax (212) 669-4002.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

- 1) Provide bona-fide benefits which cost the employer no less than the prevailing supplemental benefits rate; or
- 2) Supplement the employee's hourly wage by an amount no less than the prevailing supplemental benefits rate; or
- 3) Provide a combination of bona-fide benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.

Benefits are paid for EACH HOUR WORKED unless otherwise noted.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE



Office of the Comptroller
BUREAU OF LABOR LAW

CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
JOHN C. LIU

BUREAU OF LABOR LAW

MUNICIPAL BUILDING
ONE CENTRE STREET, ROOM 1120
NEW YORK, N.Y. 10007-2341

TEL: (212) 669-4443
FAX: (212) 669-4002

If you are a Covered Building Service Employee and you have been paid less than the Prevailing Wage and Benefits, please contact us at 212-669-4443 or download our complaint form from our website at WWW.COMPTROLLER.NYC.GOV (click on the Bureau of Labor Law).

Si es un empleado de servicios a edificios elegible y recibió menos del sueldo prevalente y beneficios, por favor contáctenos en 212-669-4443 o descarga un formulario de reclamo del sitio del Internet WWW.COMPTROLLER.NYC.GOV (oprime "Oficina de Derecho Laboral").

Wasyi Kinach, P.E.
Director of Classifications
Bureau of Labor Law

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

§230 SCHEDULE OF PREVAILING WAGES AND SUPPLEMENTAL BENEFITS ADDENDUM
EFFECTIVE PERIOD JANUARY 1, 2013 THROUGH JUNE 30, 2013

List of Amended Changes

1. MODIFIED PREAMBLE TO INCORPORATE PROVISIONS OF NYC
ADMINISTRATIVE CODE §6-130

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

BOILER SERVICEPERSON/TANK CLEANER MECHANIC (LOW PRESSURE)

Boiler Service Person/Tank Cleaner Mechanic (Low Pressure)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$11.37

Supplemental Benefit Rate per Hour: \$5.57

Overtime Description

Work in excess of 8 hours performed on a Sunday or Holiday shall be paid two and one half times the regular rate.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Employee's Birthday

Vacation

1 year service.....	five (5) days
3 years service or more.....	ten (10) days
8 years service or more.....	fifteen (15) days
13 years service or more.....	twenty (20) days

SICK LEAVE:

1-2 years employment.....	4 days
2-3 years employment.....	5 days
3-4 years employment.....	6 days
4-5 years employment.....	8 days
6 years or more employment.....	10 days

(Local #32 B/J)

BUILDING CLEANER AND MAINTAINER (OFFICE)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Office Building Class "A" Handyperson (Over 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$24.77
Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$25.10
Supplemental Benefit Rate per Hour: \$9.51

Office Building Class "A" Foreperson, Starter (Over 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$24.66
Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$24.99
Supplemental Benefit Rate per Hour: \$9.51

Office Building Class "A" Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director (Over 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$22.65
Supplemental Benefit Rate per Hour: \$9.13
Supplemental Note: for new employee 0-12 months of employment - \$6.64; for new employee 13-24 months of employment - \$8.81

Effective Period: 1/1/2013 - 6/30/2013
Wage Rate per Hour: \$22.97
Supplemental Benefit Rate per Hour: \$9.51
Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director may be paid 75% of the wage rate above for the first 21 months of employment, 85% of the wage rate above for the 22nd through 42nd months of employment, and upon the completion of 42 months of employment employee shall be paid the full wage rate. Note: New Hires hired before January 1, 2012 will continue to receive 80% of the wage rate above for the first 30 months, and upon the completion of 30 months of employment employee shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Office Building Class "B" Handyperson (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012
Wage Rate per Hour: \$24.74
Supplemental Benefit Rate per Hour: \$9.13

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$25.07

Supplemental Benefit Rate per Hour: \$9.51

Office Building Class "B" Foreperson, Starter (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$24.63

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$24.95

Supplemental Benefit Rate per Hour: \$9.51

Office Building Class "B" Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$22.62

Supplemental Benefit Rate per Hour: \$9.13

Supplemental Note: for new employee 0-12 months of employment - \$6.64; for new employee 13-24 months of employment - \$8.81

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$22.94

Supplemental Benefit Rate per Hour: \$9.51

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director may be paid 75% of the wage rate above for the first 21 months of employment, 85% of the wage rate above for the 22nd through 42nd months of employment, and upon the completion of 42 months of employment employee shall be paid the full wage rate. Note: New Hires hired before January 1, 2012 will continue to receive 80% of the wage rate above for the first 30 months, and upon the completion of 30 months of employment employee shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Office Building Class "C" Handyperson (Less than 120,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$24.70

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$25.02

Supplemental Benefit Rate per Hour: \$9.51

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Office Building Class "C" Foreperson, Starter (Less than 120,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$24.59

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$24.91

Supplemental Benefit Rate per Hour: \$9.51

Office Building Class "C" Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director (Less than 120,000 square feet gross area)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$22.57

Supplemental Benefit Rate per Hour: \$9.13

Supplemental Note: for new employee 0-12 months of employment - \$6.64; for new employee 13-24 months of employment - \$8.81

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$22.90

Supplemental Benefit Rate per Hour: \$9.51

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director may be paid 75% of the wage rate above for the first 21 months of employment, 85% of the wage rate above for the 22nd through 42nd months of employment, and upon the completion of 42 months of employment employee shall be paid the full wage rate.

Note: New Hires hired before January 1, 2012 will continue to receive 80% of the wage rate above for the first 30 months, and upon the completion of 30 months of employment employee shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for work on a holiday plus the day's pay.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Vacation

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE

Less than 6 months of work.....no vacation
6 months of work.....three (3) days
1 year of work.....ten (10) days
5 years of work.....fifteen (15) days
15 years of work.....twenty (20) days
21 years of work.....twenty-one (21) days
22 years of work.....twenty-two (22) days
23 years of work.....twenty-three (23) days
24 years of work.....twenty-four (24) days
25 years or more of work.....twenty-five (25) days
Plus two Personal Days per year.

Sick Leave:

10 sick days per year.

Unused sick leave paid in the succeeding January, one full day pay for each unused sick day.

(Local #32 B/J)

BUILDING CLEANER AND MAINTAINER (RESIDENTIAL)

Residential Building Class "A" Handyperson

Residential Buildings Class "A": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of over \$4000.00 a room.

Effective Period: 7/1/2012 – 4/20/2013

Wage Rate per Hour: **\$22.94**

Supplemental Benefit Rate per Hour: **\$8.68**

Supplemental Note: Effective 1/1/2013 - \$9.43

Effective Period: 4/21/2013 - 6/30/2013

Wage Rate per Hour: **\$23.57**

Supplemental Benefit Rate per Hour: **\$9.43**

Residential Building Class "A" Cleaner/Porter

Residential Buildings Class "A": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of over \$4000.00 a room.

Effective Period: 7/1/2012 - 4/20/2013

Wage Rate per Hour: **\$20.77**

Supplemental Benefit Rate per Hour: **\$8.68**

Supplemental Note: for new employee 0-12 months of employment - \$6.37; for new employee 13-24 months of employment - \$8.43

Effective 1/1/2013 - \$9.43; for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

Effective Period: 4/21/2013 - 6/30/2013

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE**

Wage Rate per Hour: \$21.34

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Residential Building Class "B" Handyperson

Residential Building Class "B": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of over \$2000.00 a room and not over \$4000.00 a room.

Effective Period: 7/1/2012 - 4/20/2013

Wage Rate per Hour: \$22.88

Supplemental Benefit Rate per Hour: \$8.68

Supplemental Note: Effective 1/1/2013 - \$9.43

Effective Period: 4/21/2013 - 6/30/2013

Wage Rate per Hour: \$23.51

Supplemental Benefit Rate per Hour: \$9.43

Residential Building Class "B" Cleaner/Porter

Residential Building Class "B": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of over \$2000.00 a room and not over \$4000.00 a room.

Effective Period: 7/1/2012 - 4/20/2013

Wage Rate per Hour: \$20.71

Supplemental Benefit Rate per Hour: \$8.68

Supplemental Note: for new employee 0-12 months of employment - \$6.37; for new employee 13-24 months of employment - \$8.43

Effective 1/1/2013 - \$9.43; for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

Effective Period: 4/21/2013 - 6/30/2013

Wage Rate per Hour: \$21.28

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Residential Building Class "C" Handyperson

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE**

Residential Building Class "C": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of \$2000.00 or less a room.

Effective Period: 7/1/2012 - 4/20/2013

Wage Rate per Hour: \$22.83

Supplemental Benefit Rate per Hour: \$8.68

Supplemental Note: Effective 1/1/2013 - \$9.43

Effective Period: 4/21/2013 - 6/30/2013

Wage Rate per Hour: \$23.45

Supplemental Benefit Rate per Hour: \$9.43

Residential Building Class "C" Cleaner/Porter

Residential Building Class "C": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of \$2000.00 or less a room.

Effective Period: 7/1/2012 - 4/20/2013

Wage Rate per Hour: \$20.65

Supplemental Benefit Rate per Hour: \$8.68

Supplemental Note: for new employee 0-12 months of employment - \$6.37; for new employee 13-24 months of employment - \$8.43

Effective 1/1/2013 - \$9.43; for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

Effective Period: 4/21/2013 - 6/30/2013

Wage Rate per Hour: \$21.23

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for work on a holiday plus the day's pay.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Thanksgiving Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Christmas Day

Vacation

6 months.....three (3) days
1 year.....ten (10) days
5 years.....fifteen (15) days
15 years.....twenty (20) days
21 years.....twenty-one (21) days
22 years.....twenty-two (22) days
23 years.....twenty-three (23) days
24 years.....twenty-four (24) days
25 years.....twenty-five (25) days
Plus two Personal Days per year.

SICK LEAVE

After 1 year of service.....ten (10) days per year

(Local #32 B/J)

BUILDING HVAC SERVICES OPERATOR

Engineer (Refrigeration)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$34.15**

Supplemental Benefit Rate per Hour: **\$15.44**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$35.18**

Supplemental Benefit Rate per Hour: **\$15.78**

Fireperson

Fireperson (Helper): Assists the Engineer

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$26.59**

Supplemental Benefit Rate per Hour: **\$15.09**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$27.39**

Supplemental Benefit Rate per Hour: **\$15.41**

Overtime Description

All hours worked on a holiday shall be paid at two and one half times the regular wage rate in lieu of the paid day off.

Overtime

Time and one half the regular rate after an 8 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Plus six (6) floating Holidays

Vacation

6 months	three (3) days
1 year	ten (10) days
5 years	fifteen (15) days
15 years	twenty (20) days
21 years.....	twenty-one (21) days
22 years	twenty-two (22) days
23 years	twenty-three (23) days
24 years	twenty-four (24) days
25 years	twenty-five (25) days

(Local #94)

CLEANER (PARKING GARAGE)

Garage Cleaner

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$10.00

Supplemental Benefit Rate per Hour: \$1.50

Overtime

Time and one half the regular rate after an 8 hour day or after 40 hours in any work week.

(NYC Administrative Code §6-109)

FUEL OIL

Fuel Oil, Coal, Fuel Gas, Petroleum Product Chauffeur (5th Year and above)

Effective Period: 7/1/2012 - 12/15/2012

Wage Rate per Hour: \$30.11

Supplemental Benefit Rate per Hour: \$18.80

Effective Period: 12/16/2012 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$30.61**
Supplemental Benefit Rate per Hour: **\$19.80**
Supplemental Note: Effective 1/1/2013 - \$20.42

Fuel Oil, Coal, Fuel Gas, Petroleum Product Chauffeur (4th Year)

Effective Period: 7/1/2012 - 12/15/2012
Wage Rate per Hour: **\$27.50**
Supplemental Benefit Rate per Hour: **\$18.80**

Effective Period: 12/16/2012 - 6/30/2013
Wage Rate per Hour: **\$28.00**
Supplemental Benefit Rate per Hour: **\$19.80**
Supplemental Note: Effective 1/1/2013 - \$20.42

Fuel Oil, Coal, Fuel Gas, Petroleum Product Chauffeur (3rd Year)

Effective Period: 7/1/2012 - 12/15/2012
Wage Rate per Hour: **\$25.50**
Supplemental Benefit Rate per Hour: **\$18.80**

Effective Period: 12/16/2012 - 6/30/2013
Wage Rate per Hour: **\$26.00**
Supplemental Benefit Rate per Hour: **\$19.80**
Supplemental Note: Effective 1/1/2013 - \$20.42

Fuel Oil, Coal, Fuel Gas, Petroleum Product Chauffeur (2nd Year)

Effective Period: 7/1/2012 - 12/15/2012
Wage Rate per Hour: **\$23.50**
Supplemental Benefit Rate per Hour: **\$18.80**

Effective Period: 12/16/2012 - 6/30/2013
Wage Rate per Hour: **\$24.00**
Supplemental Benefit Rate per Hour: **\$19.80**
Supplemental Note: Effective 1/1/2013 - \$20.42

Fuel Oil, Coal, Fuel Gas, Petroleum Product Chauffeur (1st Year)

Effective Period: 7/1/2012 - 12/15/2012
Wage Rate per Hour: **\$21.50**
Supplemental Benefit Rate per Hour: **\$18.80**

Effective Period: 12/16/2012 - 6/30/2013
Wage Rate per Hour: **\$22.00**
Supplemental Benefit Rate per Hour: **\$19.80**
Supplemental Note: Effective 1/1/2013 - \$20.42

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

Martin Luther King Jr. Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).

New Year's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Vacation

Less than 75 days worked.....no vacation.
75 days worked, but less than 110 days worked in a calendar year.....five (5) days the following year.
110 days or more worked in a calendar year.....ten (10) days the following year.

SICK LEAVE:

1 day sick leave earned for each 40 days worked in the preceding calendar year for a maximum of five (5) days per calendar year.

(Local #553)

GARDENER

Gardener

Effective Period: 7/1/2012 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$17.04**

Supplemental Benefit Rate per Hour: **\$1.72**

Overtime

Time and one half the regular rate after an 8 hour day or after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

LOCKSMITH

Locksmith

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: **\$21.46**

Supplemental Benefit Rate per Hour: **\$5.89**

Overtime

Time and one half the regular rate after an 8 hour day or after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

MEDICAL WASTE REMOVAL

Driver

Effective Period: 7/1/2012 - 3/31/2013

Wage Rate per Hour: **\$17.75**

Supplemental Benefit Rate per Hour: **\$8.79**

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate per Hour: **\$18.00**

Supplemental Benefit Rate per Hour: **\$9.34**

Helper

Effective Period: 7/1/2012 - 3/31/2013

Wage Rate per Hour: **\$14.00**

Supplemental Benefit Rate per Hour: **\$8.79**

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate per Hour: **\$14.25**

Supplemental Benefit Rate per Hour: **\$9.34**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE

Tractor Trailer Driver

Effective Period: 7/1/2012 - 3/31/2013

Wage Rate per Hour: \$20.25

Supplemental Benefit Rate per Hour: \$8.79

Effective Period: 4/1/2013 - 6/30/2013

Wage Rate per Hour: \$20.50

Supplemental Benefit Rate per Hour: \$9.34

Overtime Description

Time and one half the regular hourly rate after an 8 hour day or after 40 hours in any work week. The seventh day of work in a workweek is paid at double time the regular hourly rate. Time and one half the regular hourly rate for work on a holiday plus days pay for below paid holidays.

Paid Holidays

Presidents' Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Vacation

1 year of service but less than five years.....10 days

5 years of service but less than ten years.....15 days

10 years of service.....16 days

11 years.....17 days

12 years.....18 days

13 years.....19 days

14 years.....20 days

20 years.....21 days

21 years.....22 days

22 years.....23 days

23 years.....24 days

24 years.....25 days

Plus 5 Personal Days

(Local #813)

MOVER – OFFICE FURNITURE AND EQUIPMENT

Heavy and Tractor Trailer Truck Driver

Tractor-trailer combination or a truck with a capacity of at least 26,000 pounds Gross Vehicle Weight (GVW)

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$23.11

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$4.10

Light Truck Driver

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$18.08

Supplemental Benefit Rate per Hour: \$4.10

Laborer and Freight, Stock, and Material Movers, Hand

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$17.68

Supplemental Benefit Rate per Hour: \$4.10

Overtime

Time and one half the regular rate after an 8 hour day or after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

REFUSE REMOVER

Refuse Remover

Effective Period: 7/1/2012 - 6/30/2013

Wage Rate per Hour: \$27.62

Supplemental Benefit Rate per Hour: \$4.10

Overtime

Time and one half the regular rate after an 8 hour day or after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

SECURITY GUARD (ARMED)

Security Guard (Armed)

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$27.75

Supplemental Benefit Rate per Hour: \$4.73

Supplemental Note: for new employee 0-30 days of employment - \$4.09; for new employee 31-120 days of employment - \$4.26; for new employee 121 days - 2 years of employment - \$4.37

Effective Period: 1/1/2013 - 6/30/2013

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE**

Wage Rate per Hour: \$28.00

Supplemental Benefit Rate per Hour: \$4.90

Supplemental Note: for new employee 0-30 days of employment - \$4.26; for new employee 31-120 days of employment - \$4.43; for new employee 121 days - 2 years of employment - \$4.54

Months of employment shall be defined as an Employee's length of service with the Employer or at the Facility, whichever is greater.

Overtime Description

A guard who works a holiday is paid the regular rate plus receives the paid holiday.

Supplemental Benefits shall be paid for each hour paid, up to forty (40) paid hours per week.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Vacation

Months on payroll

Vacation with Pay

6

3 days

12

5 days

24

10 days

60

15 days

180

20 days

300

25 days

Sick Leave

Employees accrue paid sick leave at the rate of one (1) sick day for every six (6) months worked, up to a maximum of six (6) days a year.

(Local #32B/J)

SECURITY GUARD (UNARMED)

Security Guard (Unarmed) 0 - 6 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$12.60

Supplemental Benefit Rate per Hour: \$4.37

Supplemental Note: for new employee 0-30 days of employment - \$4.09; for new employee 31-120 days of employment - \$4.26

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$12.85

Supplemental Benefit Rate per Hour: \$4.54

Supplemental Note: for new employee 0-30 days of employment - \$4.26; for new employee 31-120 days of employment - \$4.43

Security Guard (Unarmed) 7 - 12 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$13.10

Supplemental Benefit Rate per Hour: \$4.37

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$13.35

Supplemental Benefit Rate per Hour: \$4.54

Security Guard (Unarmed) 13 - 18 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$13.60

Supplemental Benefit Rate per Hour: \$4.37

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$13.85

Supplemental Benefit Rate per Hour: \$4.54

Security Guard (Unarmed) 19 - 24 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$14.10

Supplemental Benefit Rate per Hour: \$4.37

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$14.35

Supplemental Benefit Rate per Hour: \$4.54

Security Guard (Unarmed) 25 - 30 months

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$14.60

Supplemental Benefit Rate per Hour: \$4.73

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$14.85

Supplemental Benefit Rate per Hour: \$4.90

Security Guard (Unarmed) 31 months or more

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$14.75

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$230 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$4.73

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$15.15

Supplemental Benefit Rate per Hour: \$4.90

Months of employment shall be defined as an Employee's length of service with the Employer or at the Facility, whichever is greater.

Overtime Description

A guard who works a holiday is paid the regular rate plus receives the paid holiday.

Supplemental Benefits shall be paid for each hour paid, up to forty (40) paid hours per week.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Vacation

Months on payroll	Vacation with Pay
6	3 days
12	5 days
24	10 days
60	15 days
180	20 days
300	25 days

Sick Leave

Employees accrue paid sick leave at the rate of one (1) sick day for every six (6) months worked, up to a maximum of six (6) days a year.

(Local #32B/J)

WINDOW CLEANER

Window Cleaner

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$26.12

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$26.44

Supplemental Benefit Rate per Hour: \$9.51

Power Operated Scaffolds, Manual Scaffolds, and Boatswain Chairs

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$28.37

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$28.69

Supplemental Benefit Rate per Hour: \$9.51

Window Cleaner Apprentice (0 - 3 months)

Employee must be a registered apprentice with the New York State Department of Labor

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$19.35

Supplemental Benefit Rate per Hour: \$0.00

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$19.59

Supplemental Benefit Rate per Hour: \$0.00

Window Cleaner Apprentice (4 - 7 months)

Employee must be a registered apprentice with the New York State Department of Labor

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$20.92

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$21.18

Supplemental Benefit Rate per Hour: \$9.51

Window Cleaner Apprentice (8 - 11 months)

Employee must be a registered apprentice with the New York State Department of Labor

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: \$22.17

Supplemental Benefit Rate per Hour: \$9.13

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: \$22.44

Supplemental Benefit Rate per Hour: \$9.51

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Window Cleaner Apprentice (12 - 15 months)

Employee must be a registered apprentice with the New York State Department of Labor

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$23.43**

Supplemental Benefit Rate per Hour: **\$9.13**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$23.72**

Supplemental Benefit Rate per Hour: **\$9.51**

Window Cleaner Apprentice (16 - 17 months)

Employee must be a registered apprentice with the New York State Department of Labor

Effective Period: 7/1/2012 - 12/31/2012

Wage Rate per Hour: **\$24.70**

Supplemental Benefit Rate per Hour: **\$9.13**

Effective Period: 1/1/2013 - 6/30/2013

Wage Rate per Hour: **\$25.01**

Supplemental Benefit Rate per Hour: **\$9.51**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Birthday

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Personal Day

Vacation

After 7 months but less than 1 year of service.....5 days

1 year but less than 5 years of service.....10 days

5 years of service but less than 15 years of service.....15 days

15 years of service but less than 21 years of service.....20 days

21 years.....21 days

22 years.....22 days

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

23 years.....23 days
24 years.....24 days
25 years or more of service.....25 days
Plus 1 day per year for medical visit

SICK LEAVE:

10 days after one year worked. Unused sick days to be paid in cash.

(Local #32 B/J)

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SECTION 01000

GENERAL CONDITIONS

APPLICABLE TO ALL CONTRACTS

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The ADDENDUM TO THE GENERAL CONDITIONS is contained in Volume 3 of the Contract Documents. Volume 3 contains the following:

- Addendum to the General Conditions
- Specifications

SECTION 01000 GENERAL CONDITIONS

PART 1 - GENERAL

1.01 Applicability of General Conditions

- A. Since there are several separate Contracts pertaining to the construction of this project, for convenience, the General Conditions are stated only once. These General Conditions are applicable to all Contracts and shall constitute an integral part of each separate Contract to the same extent as though they were repeated in full therein.
- B. The Contractor is advised that various sections of these General Conditions are amended by the Addendum to the General Conditions. This Addendum also includes various schedules referred to in these General Conditions (Schedules A through F). These schedules contain important information that is specific to this project. The Addendum, including Schedules A through F, is set forth in Volume 3 of the Contract Documents.
- C. Throughout these General Conditions, various responsibilities and obligations are assigned to each of the following four Contractors: (1) General Construction, (2) Plumbing, (3) Heating/Ventilating/Air-Conditioning/Fire Protection, and (4) Electrical. In the event the Project does not involve all four Contracts, the responsibilities and obligations of each omitted Contract shall be assigned to one of the Contracts which is included in the Project. The Addendum to the General Conditions specifies which Contractor shall perform the responsibilities and obligations of each omitted contract, as set forth in the General Conditions.

1.02 Scope and Intent

- A. DESCRIPTION OF PROJECT - Refer to the Addendum to the General Conditions for a description of this project.
- B. PROGRESS SCHEDULE
 - 1. Within 15 days after the Notice to Proceed, the Contractor for General Construction Work shall prepare a composite Job Progress Chart that shall indicate graphically and chronologically the time the various parts of the work of all Contracts shall commence and be completed. The Chart shall be in a reproducible form approved by the Commissioner.
 - 2. Immediately after the Notice to Proceed of their Contracts, the Contractors for Plumbing Work, Heating, Ventilating and Air Conditioning Work (HVAC) and Electrical Work, as applicable, shall furnish all necessary data to the Contractor for General Construction Work, and cooperate in all respects in connection with formulation of the Chart.
 - 3. The Chart shall show the sequence and interrelationship of each operation of all the Contracts.
 - 4. The Chart shall show the estimated time for fabrication and/or delivery of all materials and equipment required for the work.
 - 5. As directed by the Resident Engineer, the Contractors shall meet with each other and with the Resident Engineer to review and make the necessary adjustments to the composite Job Progress Chart, and to coordinate the work indicated thereon. (Article 12 of the Contract).
 - 6. When completed, the Job Progress Chart shall be signed and dated by each Contractor or their official representative. The Resident Engineer is authorized to sign the Chart for the Department of Design and Construction. Thereafter, the Chart shall be modified only with the Commissioner's approval. When directed by the Commissioner, the Chart shall be revised and updated. If necessary, a new revised Chart shall be prepared in the same manner as outlined above for the original Chart.

7. The approved Chart shall be distributed by the Contractor for General Construction Work, as follows: the original and two (2) copies to the Resident Engineer, two (2) copies to each Contractor, and two (2) copies to the Department of Design and Construction
 8. All Contractors shall consult the approved Progress Chart and install their work within the time limits indicated on the Chart.
 9. The Resident Engineer shall post in a prominent place in the field office a copy of the Chart and mark thereon the progress of the work, including the times when various parts of the work commenced and were completed.
- C. **COMPLETION OF WORK** - Work to be done under each separate Contract comprises the furnishing of all labor, materials, equipment and other appurtenances and obtaining of all regulatory agency approvals necessary and required to complete the construction work in accordance with the Contract.
 - D. **OMISSION OF DETAILS** - All work called for in the Specifications applicable to each separate Contract but not shown on the Contract Drawings in their present form, or vice versa, is required, and shall be performed by the Contractor as though it were originally delineated or described. Such work is deemed included in the Bid Price.
 - E. **WORK NOT IN SPECIFICATIONS OR CONTRACT DRAWINGS** - Work not particularly specified in the Specifications nor detailed on the Contract Drawings but involved in carrying out their intent or in the complete and proper execution of the work, is required, and shall be performed by the Contractor. Such work is deemed included in the Bid Price.
 - F. **SILENCE OF THE SPECIFICATIONS** - The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best practice is to prevail and that only the best material and workmanship is to be used and interpretation of the Specifications shall be made upon that basis.
 - G. **CONFLICT BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS** - Should any conflict occur in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated on the most expensive way of doing the work unless the Contractor shall have asked for and obtained a decision in writing from the Commissioner before the submission of the bid as to what shall govern.
 - H. **COOPERATION BETWEEN CONTRACTORS** - Inasmuch as the completion of the project within the prescribed limit of time is dependent largely upon the close and active cooperation of all those engaged therein, it is therefore expressly understood and agreed that the Contractor shall lay out and install all work at such time or times and in such manner as not to delay or interfere with the carrying forward of the work of other Contractors. In the event of any dispute arising as to possible or alleged interference between the various Contractors which may retard the progress of the work, the dispute shall be adjudicated by the Commissioner, whose decision as to the party or parties at fault and as to the manner in which the matter may be adjudicated, shall be binding and conclusive on all parties.
 - I. **"DIRECTED," "REQUIRED," ETC.** - Wherever reference is made in the Contract to the work or its performance, the terms "directed," "required," "permitted," "ordered," "designated," "prescribed," "determined," and words of similar import shall, unless expressed otherwise, imply the direction, requirements, permission, order, designation or prescription of the Commissioner.
 - J. **"APPROVED," ETC.** - "Approved," "acceptable," "satisfactory," and words of similar import shall mean and intend approved, acceptable or satisfactory to the Commissioner.
 - K. **CONFLICTS OF INTERESTS** - The Charter of the City of New York, Section 2604, provides a number of safeguards in relation to conflicts of interest. Such safeguards include, without limitation, the following: "No public servant shall receive compensation except from the City for performing any official duty or accept or receive any gratuity from any person whose interest may be affected by the

public servant's official action."

1. Other sections of the City Charter, the Administrative Code and the Penal Law are applicable in implementing the basic Conflicts of Interest Section and under certain circumstances penalties may be invoked against the donor as well as the recipient of any form of valuable gift.
2. Notice is hereby given that sections of the City Charter, the Administrative Code and the Penal Law alluded to herein shall apply under the terms of this Contract to circumstances relevant to conflicts of interest and shall be extended in application to subcontractors authorized to perform work, labor and services pursuant to this Contract and further, it shall be the duty and responsibility of the Contractors to so inform their respective subcontractors.

1.03 Provisions Referenced in the Contract

- A. Various Articles of the Contract refer to requirements set forth in Schedule A of the General Conditions. Schedule A, which is included in the Addendum to the General Conditions, sets forth 1) the referenced Articles of the Contract, and 2) the specific requirements applicable to each respective Contract.
- B. Applications for Extensions of Time, as indicated in Article 13 of the Contract, shall be made in accordance with the Rules of the Procurement Policy Board.
- C. **PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE "CONTRACT"** - In order to better insure the availability of materials, fixtures and equipment when needed for the work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the work, but only in strict accordance with, and subject to, all the terms and conditions set forth in the Specifications, unless an alternate method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment.
 1. The Contractor shall submit to the Commissioner a written request, in quadruplicate, for payment for materials purchased or to be purchased for which the Contractor needs to be paid prior to their actual incorporation in the work. The request shall be accompanied by a schedule of the types and quantities of materials, and shall state whether such materials are to be stored on or off the site.
 2. Where the materials are to be stored off the site, they shall be stored at a place other than the Contractor's premises (except with the written consent of the Commissioner) and under the conditions prescribed or approved by the Commissioner. The Contractor shall set apart and separately store at the place or places of storage all materials and shall clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, shall not at any time move any of said materials to another off-site place of storage without the prior written consent of the Commissioner. Materials may be removed from their place of storage off the site for incorporation in the work upon approval of the Resident Engineer.
 3. Where the materials are to be stored at the site, they shall be stored at such locations as shall be designated by the Resident Engineer and only in such quantities as, in the opinion of the Resident Engineer, will not interfere with the proper performance of the work by the Contractor or by other Contractors then engaged in performing work on the site. Such materials shall not be removed from their place of storage on the site except for incorporation in the work, without the approval of the Resident Engineer.
4. **INSURANCE**
 - a. **STORAGE OFF-SITE** - Where the materials are stored off the site and until such time as they are incorporated in the work, the Contractor shall fully insure such materials against any and all risks of destruction, damage or loss including but not limited to fire, theft, and any other casualty or happening. The policy of insurance shall be payable to the City of New York. It shall be in such terms and amounts as shall be approved by the Commissioner and shall be

placed with a company duly licensed to do business in the State of New York. The Contractor shall deliver the original and one (1) copy of such policy or policies marked "Fully Paid" to the Commissioner.

- b. STORAGE ON THE SITE - Where the materials are stored at the site, the Contractor shall furnish satisfactory evidence to the Commissioner that they are properly insured against loss, by endorsements or otherwise, under the policy or policies of insurance obtained by the Contractor to cover losses to materials owned or installed by the Contractor. The policy of insurance shall cover fire and extended coverage against windstorm, hail, explosion and riot attending a strike, civil commotion, aircraft, vehicles and smoke.
5. All costs, charges and expenses arising out of the storage of such materials, shall be paid by the Contractor and the City hereby reserves the right to retain out of any partial or final payment made under the Contract an amount sufficient to cover such costs, charges and expenses with the understanding that the City shall have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There shall be no increase in the Contract price for such costs, charges and expenses and the Contractor shall not make any claim or demand for compensation therefor.
6. The Contractor shall pay any and all costs of handling and delivery of materials, to the place of storage and from the place of storage to the site of the work; and the City shall have the right to retain from any partial or final payment an amount sufficient to cover the cost of such handling and delivery.
7. In the event that the whole or any part of these materials are lost, damaged or destroyed in advance of their satisfactory incorporation in the work, the Contractor, at the Contractor's own cost, shall replace such lost, damaged or destroyed materials of the same character and quality. The City will reimburse the Contractor for the cost of the replaced materials to the extent, and only to the extent, of the funds actually received by the City under the policies of insurance hereinbefore referred to. Until such time as the materials are replaced, the City will deduct from the value of the stored materials or from any other money due under the Contract, the amount paid to the Contractor for such lost, damaged or destroyed materials.
8. Should any of the materials paid for the City hereunder be subsequently rejected or incorporated in the work in a manner or by a method not in accordance with the Contract and Specifications, the Contractor shall remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract and Specifications. Until such materials are replaced, the City will deduct from the value of the stored materials or from any other money due the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.
9. Payments for the cost of materials made hereunder shall not be deemed to be an acceptance of such materials as being in accordance with the Contract Documents, and the Contractor always retains and must comply with the Contractor's duty to deliver to the site and properly incorporate in the work only materials which comply with the Contract Documents.
10. The Contractor shall retain any and all risks in connection with the damage, destruction or loss of the materials paid for hereunder to the time of delivery of the same to the site of the work and their proper incorporation in the work in accordance with the Contract Documents.
11. The Contractor shall comply with all laws and the regulations of any governmental body or agency pertaining to the priority purchase, allocation and use of the materials.
12. When requesting payment for such materials, the Contractor shall submit with the partial estimate duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The executed bills of sale shall transfer title to the materials from the Contractor to the City (in the event that the invoices state that the material has been purchased by a subcontractor, bills of sale in quadruplicate will also be required transferring title to the materials

from subcontractor to the Contractor).

13. Where the Contractor, with the approval of the Commissioner, has purchased unusually large quantities of materials in order to assure their availability for the work, the Commissioner, at the Commissioner's option, may waive the requirements of Paragraph 12 provided the Contractor furnishes evidence in the form of an affidavit from the Contractor in quadruplicate, and such other proof as the Commissioner may require, that the Contractor is the sole owner of such materials and has purchased them free and clear of all liens and other encumbrances. In such event, the Contractor shall pay for such materials and submit proof thereof, in the same manner as provided in Paragraph 12 hereof, within seven (7) days after receipt of payment therefor from the Comptroller. Failure on the part of the Contractor to submit satisfactory evidence that all such materials have been paid for in full, shall preclude the Contractor from payments under the Contract.
14. The Contractor shall include in each succeeding partial estimate requisition a summary of materials stored which shall set forth the quantity and value of materials in storage, on or off the site, at the end of each preceding estimate period; the amount removed for incorporation in the work; the quantity and value of materials delivered during the current period and the total value of materials on hand for which payment thereof will be included in the current payment estimate.
15. Upon proof to the satisfaction of the Commissioner of the actual cost of such materials and upon submission of proper proof of title as required under Paragraph 12 or Paragraph 13 hereof, payment will be made therefore to the extent of 85%, provided however, that the cost so verified, established and approved shall not exceed the estimated cost of such materials included in the approved detailed breakdown estimate submitted in accordance with Article 41 of the Contract; if it does, the City will pay only 85% approved estimated cost.
16. Upon the incorporation in the work of any such materials, which have been paid for in advance of such incorporation in accordance with the foregoing provisions, payment will be made for such materials incorporated in the work pursuant to Article 42 of the Contract, less any sums paid pursuant to Paragraph 15 herein.

D. EXCISE AND TRANSPORTATION TAXES- Pursuant to Section 6 of the "Information for Bidders", the Contractor may be exempted from the payment of Federal Excise and Transportation Taxes in accord with the following:

1. Excise Tax Exemption Certificate will be certified by the Department of Design and Construction where requested by the Contractor, for items which fall within the scope of the Contract and which may be exempt from Federal Excise Tax.
2. TRANSPORTATION TAX - The 3% Federal Tax has been repealed and is hereby deleted from the Contract. The 10% Federal Tax for travel remains in effect.

E. CORRESPONDENCE - There shall be six (6) copies of all letters of correspondence to the Department of Design and Construction. An additional copy of all correspondence shall be sent directly to the Resident Engineer at the job site.

F. MOBILIZATION PAYMENT - A line item for mobilization shall be allowed on the Contractor's Detailed Estimate Breakdown submitted in accordance with Article 41 of the Contract. The Mobilization Payment is intended to include the cost of required bonds, insurance coverage and/or any other expenses required for the initiation of the Contract Work. All costs for mobilization shall be deemed included in the total Contract Price. The Detailed Estimate shall reflect, and the Mobilization Payment shall be made, in accordance with the following schedule:

Contract Amount		Percent	Mobilization
Less than \$	50,000 x	0 =	0
\$ 50,000 - \$	100,000	= \$	6,000
\$ 100,001 - \$	500,000 x	6 = \$	6,000 (min) - \$ 30,000 (max)

\$ 500,001 - \$ 2,500,000	x	5	=	\$ 30,000 (min) - \$ 125,000 (max)
Over \$ 2,500,000	x	4	=	\$ 125,000 (min) - \$ 300,000 (max)

The Contractor may requisition for one-half (1/2) of the Mobilization Payment upon satisfactory completion of the following:

1. Installation of any required field office(s).
2. Submission of all required insurance certificates and bonds.
3. Approval by the Department of Design and Construction of the coordinated progress schedule for the project and the Contractor's Shop Drawing schedule.

The remaining balance of the Mobilization Payment may be requisitioned only after 10 percent (10%) of the Contract price, exclusive of the total amount of Mobilization Payments made or to be made hereunder, shall have been approved for payment.

1.04 Contract Drawings

- A. SCHEDULE C - The Contract Drawings are listed in Schedule C, which is set forth in the Addendum to the General Conditions. Such drawings referred to in the Contract, and in the applicable Specifications for the various Contracts bear the general title:

City of New York
Department of Design and Construction
Division of Structures

- B. DOCUMENTS FURNISHED TO THE CONTRACTOR - After the award of the Contract, the Contractor for General Construction Work will be furnished with five (5) sets of paper prints of all Contract Drawings mentioned in Paragraph A above.

- C. PRINTS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

Each Contractor, other than the Contractor for General Construction Work referred to in Paragraph B, will receive two (2) sets of paper prints of all Drawings listed in Paragraph A and three (3) sets of paper prints of all Contract Drawings applying directly to each Contractor's own Contract.

- D. Each Contractor will receive nine (9) complete sets of Specifications.

- E. ADDITIONAL COPIES of Drawings and Specifications, when requested, will be furnished to the Contractor if available.

- F. COORDINATION AND COOPERATION - Since the Contracts are all related to the project, the Contractor shall consult and study the requirement of the Contract Drawings and Specifications of all Contracts furnished to the Contractor, so that the Contractor may become acquainted with the work of the project as a whole in order to achieve the proper coordination and cooperation necessary for the efficient and timely performance of the work.

- G. SUPPLEMENTARY DRAWINGS - When, in the opinion of the Commissioner, it becomes necessary to more fully explain the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings known as Supplementary Drawings will be prepared by the Commissioner.

- H. COMPENSATION - Where Supplementary Drawings entail extra work, compensation therefor to the Contractor shall be subject to the terms of the "Contract". The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings.

- I. **SUPPLEMENTARY DRAWING PRINTS** - Three (3) copies of prints of these Supplementary Drawings will be furnished to the Contractor.
- J. **COPIES TO SUBCONTRACTORS** - The Contractor shall furnish each of its subcontractors and material suppliers such copies of Contract Drawings, Supplementary Drawings, or copies of the Specifications as may be required for its work.
- K. **CONTRACTOR TO CHECK DRAWINGS** - The Contractor shall verify all dimensions, quantities and details shown on the Contract Drawings, Schedules, or other data received from the Commissioner, and shall notify the Commissioner of all errors, omissions, conflicts and discrepancies found therein. Notice of such errors shall be given before the Contractor proceeds with any work. Figures shall be used in preference to scale dimensions and large-scale drawings in preference to small-scale drawings.

1.05 Shop Drawings and Record Drawings

A. SHOP DRAWINGS

- 1. **SUBMISSION OF SHOP DRAWINGS** - For instructions relative to Shop Drawings involving electrical or mechanical work or equipment of any nature called for in any Contract, see the General Electrical Requirements and the General Mechanical Requirements.
- 2. **SHOP DRAWINGS** - The Contractor shall promptly prepare and submit layout detail and Shop Drawings of such parts of the work as are indicated in the Specifications or as required. These Shop Drawings shall be made in accordance with the Contract Drawings, Specifications and Supplementary Drawings, if any. The Shop Drawings shall be accurate and distinct and give all the dimensions required for the fabrication, erection and installation of the work.
- 3. **SIZE OF DRAWINGS** - The Shop Drawings, unless otherwise directed, shall preferably be on sheets of the same size as the Contract Drawings, with a one half (1/2) inch marginal space on each side and a two (2) inch marginal space for binding on the left side.
- 4. **SCOPE OF DRAWINGS** - Shop Drawings shall be numbered consecutively and shall accurately and distinctly represent the following:
 - a. All working and erection dimensions.
 - b. Arrangements and sectional views.
 - c. Necessary details, including performance characteristics, and complete information for making necessary connections with other work.
 - d. Kinds of materials including thicknesses and finishes.
 - e. All other information required by the Commissioner.
- 5. **TITLES AND REFERENCE** - Shop Drawings shall be dated and contain:
 - a. Name of the Project, DDC Project Number and Contract Number.
 - b. The descriptive names of equipment, or materials covered by the Contract Drawings and the classified item number or numbers, if any, under which it is, or they are required.
 - c. The locations or points at which materials, or equipment, are to be installed in the work.
 - d. Cross references to the section number, detail number and paragraph number of the Contract Specifications.

- e. Cross references to the sheet number, detail number, etc., of the Contract Drawings.

NOTE: In addition to the above requirements, the Shop Drawings shall bear a stamp having the following wording:

FIELD MEASUREMENTS - The Contractor certifies that it has verified and supplemented the Contract Drawings by taking all required field measurements, that said measurements correctly reflect all field conditions and that this Shop Drawing incorporates said measurements.

6. **THE SUBMISSION OF SHOP DRAWINGS** - The Shop Drawings shall be accompanied by a letter of transmittal, in triplicate, containing the name of the Project, the name of the Contractor, the number of Drawings, titles and any other requirements. Re-submission of the same drawings shall bear the original number of the drawings and the original titles.
7. **PRELIMINARY SUBMISSION** - The Contractor shall submit one (1) set of sepia Shop Drawings to the Consultant Architect/Engineer for their approval. A satisfactory Shop Drawing will be stamped "Approved", be dated and one (1) copy thereof will be returned to the Contractor by letter. Should the Shop Drawing not be approved by the Consultant Architect/Engineer, the Commissioner will return the sepia Shop Drawings with the necessary corrections and changes to be made as indicated thereon.
8. **REVISIONS** - The Contractor must make such corrections and changes and again submit one (1) set of sepia drawings for the approval of the Consultant Architect/Engineer. The Contractor shall revise and resubmit the Shop Drawing as required by the Consultant Architect/Engineer until approval thereof is obtained. However, Shop Drawings which have been stamped "Approved As Noted" shall be considered an "Approved" Shop Drawing and NEED NOT be revised and resubmitted.

No work called for by the Shop Drawings shall be done until the approval of the said drawings by the Consultant Architect/Engineer is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractors which Shop Drawing indicated work related to, adjacent to, impinging upon, or affecting work to be done by other Contractors, shall be transmitted to the Contractors so affected. These approved Shop Drawings shall be delivered to the Resident Engineer for distribution to the affected Contractors at the job meetings and shall be so recorded in the minutes.

9. **FINAL SUBMISSION** - When approval of any Shop Drawing is obtained by the Contractor, it shall insert the date of the approval of the drawing and promptly furnish the Consultant Architect/Engineer with eight (8) additional prints of the approved Drawings. No work called for by the Shop Drawings shall be performed until the approval of the said drawings by the Commissioner is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractors which indicates work related to, adjacent to, impinging upon, or affecting work to be done by other Contractors, shall be transmitted to the Contractors so affected. These approved Shop Drawings shall be delivered to the Resident Engineer for distribution to the affected Contractors at the job meetings and shall be so recorded in the minutes.
10. **VARIATIONS** - If the Shop Drawings show variations from the Contract requirements because of standard shop practice or other reasons, the Contractor shall make specific mention of such variations in its letter of submittal. Approval of the Shop Drawings shall constitute approval of the subject matter thereof only and not of any structural apparatus shown or indicated.
11. **CATALOGUE CUTS** - Except as otherwise prescribed herein, the submission of catalogue cuts shall conform to the procedures specified for Shop Drawings.
- a. **PRELIMINARY SUBMISSION** - The Contractor shall submit three (3) sets of catalogue cuts to the Consultant Architect/Engineer to approve. A satisfactory catalogue cut will be stamped

"Approved", be dated and one (1) copy thereof will be returned to the Contractor by letter. Should the catalogue cut not be approved by the Commissioner, the Commissioner will return one (1) set of such catalogue cuts with the necessary corrections and changes to be made indicated thereon.

- b. **REVISIONS** - The Contractor shall make such corrections and changes and again submit four (4) sets of the catalogue cuts, in duplicate, for the approval of the Commissioner. The Contractor shall revise and resubmit the catalogue cuts as required by the Consultant Architect/Engineer until approval thereof is obtained.

However, catalogue cuts which have been stamped "Approved As Noted" shall be considered an "Approved" catalogue cut and need not be revised and resubmitted.

- c. **FINAL SUBMISSION** - When approval of any catalogue cut is obtained by the Contractor, it shall insert the date of the approval and promptly furnish the Consultant Architect/Engineer with four (4) additional sets of the approved catalogue cuts.
12. **RESPONSIBILITY OF CONTRACTOR** - The approval of Shop Drawings will be general and shall not relieve the Contractor of responsibility for the accuracy of such Shop Drawings, nor for the proper fitting and construction of the work, nor of the furnishing of materials or work required by the Contract and not indicated on the Shop Drawings. Approval of Shop Drawings shall not be construed as approving departures from the Contract Drawings, Supplementary Drawings or Specifications.
13. **SHOP DRAWINGS AND MATERIAL SAMPLES SCHEDULE** - The Shop Drawings and Material Samples Schedule is set forth in Schedule F, which is included in the Addendum to the General Conditions. Completion of this Schedule shall be in accordance with Article 1.41 (A) of these General Conditions.
14. **PROCEDURE FOR PREPARING, FORWARDING, CHECKING AND RETURN** - of all Shop Drawings shall be, generally, as follows:

The Contractor shall make available to its subcontractors the necessary Contract Documents and have them determine dimensions and conditions in the field, particularly with reference to coordination with other trades or work under other Contractors. The Contractor shall direct its subcontractors to prepare Shop Drawings for submission to the Consultant Architect/Engineer in accordance with the requirements of these General Conditions. The Contractor shall also direct its subcontractors to "Ring Up" corrections made on all re-submissions for approval, so as to be readily seen, and that the symbol "sub" be used to identify the source of the correction or information that has been added.

The Contractor shall:

- a. Review and be responsible to the Commissioner, or the Commissioner's authorized representative, for information shown on subcontractor's Shop and Installation drawings and manufacturers' date, and also for conformity to Contract Documents.
- b. "Ring Up" corrections made on all submissions for approval, so as to be readily seen, and that the symbol "GC", "PL", "HVAC" or "EL" be used to indicate that the correction and/or information added was made by the Contractor.
- c. Clearly designate which trade is to perform the work when the term, "work by others" or other similar phrases are indicated on the Contract Drawings before submission to the Consultant Architect/Engineer.
- d. Stamp submissions "Recommended for Approval", date and forward to the Commissioner or the Commissioner's authorized representative.

In order to expedite Shop Drawing procedures, the Contractor shall write a Shop Drawing status letter directly to the Consultant Architect/Engineer, each week, containing the following subject matter:

- (1) A list of all Shop Drawings which have been sent to but not returned by the Architect or Engineer giving name of the subcontractor, drawing number, title and date of submission.
- (2) An indication of the desired priority of the return, if necessary.

NOTE: The status letter shall be prepared and sent at a given time each week, preferably Friday afternoon, to enable the Consultant Architect/Engineer to receive the letter on Monday morning. This procedure shall be maintained throughout the active Shop Drawing period of construction.

B. INTEGRATED DRAWINGS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. The Contractor for General Construction Work shall provide to the Contractor for Heating, Ventilating and Air Conditioning Work reflected ceiling starting points or plans, beam soffit elevations, ceiling heights, roof openings, etc.
2. The Contractor for Heating, Ventilating and Air Conditioning Work shall prepare a drawing or drawings showing ductwork, heating and sprinkler piping. This drawing shall include location of grilles, registers, etc. and access doors in hung ceilings. Locations shall be fixed by elevations and dimensions from column center lines and/or walls.
3. The Contractor for Heating, Ventilating and Air Conditioning Work shall prepare and distribute to each of the other Contractors, the Resident Engineer and to the Consultant Architect a sepia of the above.
4. The Contractor for General Construction Work shall lay out on its sepia, the reflected ceiling plan, beam soffit elevations, ceiling heights, roof openings, etc.
5. The Contractor for Plumbing Work shall lay out its piping, valves, cleanouts, etc., indicating locations and elevations and shall indicate the necessary access doors.
6. The Contractor for Electrical Work shall indicate its fixtures, large conduit runs, clearances, pull boxes, junction boxes, sound system speakers, etc.
7. The Resident Engineer will call as many meetings with the Contractors as are necessary to resolve any conflicts that become apparent. The Resident Engineer will call on the services of the Consultant Engineer or Architect where necessary. The Resident Engineer is responsible for the coordination of the Contract Drawings.
8. Upon resolution of the conflicts, each Contractor shall enter its own work on the Resident Engineer's sepia, which will become the Master or Integrated Drawing. The Master Sepia shall be signed by each Contractor to indicate its acceptance of the arrangement of the work.
9. A reproducible copy of the Master Integrated Drawing or Drawings will be prepared and distributed by the Contractor for Heating, Ventilating and Air Conditioning Work to each Contractor and to the Consultant Architect for information.
10. Each Contractor shall prepare its Shop Drawings in accordance with the Integrated Drawings. No work will be permitted without approved Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.
11. Contractors shall be held strictly accountable for cooperation in preparing the Integrated Drawing or Drawings.

C. RECORD DRAWINGS

1. The Department of Design and Construction, at the start of construction (kick-off meeting), will furnish to each Contractor at no cost a complete set of Contract Document mylars pertaining to the work to be performed under its Contract. It is the responsibility of each Contractor to modify the Contract Drawings to indicate all changes and corrections, if any, occurring in the work as actually installed. The Contractor is required to furnish all other mylar drawings if necessary such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all work in detail as actually completed.

NOTE TO CONTRACTOR: All professional seals must be blocked out. Title box complete with project title and Consultants' names will remain.

2. Each Contractor shall maintain, during the progress of the work, an accurate record of the work as actually installed, on Record Drawings, on mylar, in ink. These Record Drawings shall be made available to the Resident Engineer upon request.

The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed work, so that the Record Drawings may contain this information in exact detail and location. Record Drawings should also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

Before substantial completion payment, each Contractor shall furnish to the Commissioner one (1) complete set of mylar Record Drawings, in ink indicating all of the work and locations as actually installed, plus one (1) set of paper prints which will be furnished to sponsoring agency by Department of Design and Construction.

3. Record Drawings shall be of the same size as that of the Contract Drawings, with a one (1) inch margin on three (3) sides and a two (2) inch margin on the left side.
4. Each Record Drawing shall bear the legend "RECORD DRAWING" in heavy block lettering, one half (1/2) inch high, and contain the following data:

RECORD DRAWING

Contractor's Name _____

Contractor's Address _____

Made by .

Date _____

Checked by

Date _____

Commissioner's Representatives
(Resident Engineer)
(Plumbing Inspector)
(Heating & Ventilating Inspector)
(Electrical Inspector)

DDC
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DDC
DDC

5. RECORD DRAWING TITLE SHEET - Each Contractor shall prepare a title sheet, the same size as Record Drawings, which shall contain the following:

a. Heading:

The City of New York
Department of Design and Construction
Division of Structures

b. Capital Budget Project Number (CAPIS ID)

- c. Name and Location of Project
 - d. Contractor's Name and Address
 - e. Record of changes (a caption description of work affected, and the date and number of Change Order or other authorization)
 - f. List of Record Drawings
6. All changes from Contract Drawings shall be distinctly encircled and identified by Change Order number correlating to changes listed on the "Title Sheet." The Contractor shall show within the encircled areas the work as actually installed.
7. **BULLETINS, OPERATING AND SERVICE MANUALS** - Where the Contractor has submitted prints in the form of technical bulletins; operating and service manuals, or other printed matter as a Shop Drawing, having diagrams or drawings thereon of a material or equipment installed in the work, the Contractor shall furnish three (3) sets thereof so that the Commissioner may have all the necessary information for the proper operation maintenance and repair of the material and equipment and the ordering of spare parts. All bulletins and operating and service manuals shall be compiled and indexed in book form for each Contract.

1.06 Approval of Materials

- A. **LOCAL LAWS** - All materials, appliances and types or methods of construction shall be in accordance with the Specifications and shall in no event be less than that necessary to conform to the requirements of the Building Code of the City of New York, Administrative Code and Charter of the City of New York.
- B. **APPROVAL OF MANUFACTURER** - The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Commissioner for approval, as early as possible, to afford proper review and analysis.
- C. **REPUTE OF MANUFACTURER** - No manufacturer will be approved for any materials to be furnished under the Contract unless it shall be of good reputation, shall have a plant of ample capacity and shall have successfully produced similar products. All required approvals for legal use of materials and equipment such as B.S.A. and M.E.A. must be obtained prior to installation.
- D. **ALL MATERIALS** - fixtures, fittings, supplies and equipment furnished under the Contract shall be new and unused, except as approved by the Agency, and of standard first-grade quality and of the best workmanship and design. The City of New York encourages the use of recycled products where practical.
- E. **INFORMATION TO SUPPLIERS** - In asking for prices on materials under any item of the Contract, the Contractor shall provide the manufacturer or dealer with such complete information from the Specifications and Contract Drawings as may in any case be necessary, and in every case the Contractor shall inform the manufacturer or dealer of all the General Conditions and requirements herein contained.
- F. **STANDARD REFERENCES** - Whenever reference is made to the furnishing of materials or testing thereof to conform to the standards of any technical society, organization or body, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the date of advertisement for bids, even though reference has been made to an earlier standard.
- G. **REFERENCES** - Reference to a technical society, organization or body may be made in the Specifications by abbreviations in accordance with the following list:

A.I.A. for American Institute of Architects

A.C.I.	for American Concrete Institute
A.G.A.	for American Gas Association
A.G.M.A.	for American Gear Manufacturer Association
A.I.E.E.	for American Institute of Electrical Engineers
A.I.S.C.	for American Institute of Steel Construction
A.S.A.	for American Standards Association
A.S.T.M.	for American Society for Testing Materials
A.W.S.C.	for American Welding Society Code
A.W.W.A.	for American Water Works Association
B.S. & A.	for New York City Board of Standards & Appeals
C.I.P.R.A.	for Cast Iron Pipe Research Association
B.G. & E.	for Bureau of Gas & Electricity of the City of New York
FED. SPEC.	for Federal Specification
I.P.C.E.A.	for Insulated Power Cable Engineer's Association
NAVY SPEC.	for Navy Department Specification
N.E.C.	for National Electric Code
N.E.M.A.	for National Electrical Manufacturers Association
N.Y.B.C.	for New York City Building Code
N.Y.E.C.	for New York City Electrical Code
N.Y. SPEC.	for New York City Department of Purchase Specification
P.P.S.	for Power Piping Society
S.A.E.	for Society of Automotive Engineers Standards
S.H.B.I.	for Steel Heating Boiler Institute

- H. **STANDARD SPECIFICATIONS** - When no reference is made to a code, standard or specification, the Standard Specifications of the ASTM or the AIEE, as the case may be, shall govern.
- I. **SAMPLES OF MATERIALS** - The Contractor shall submit to the Commissioner for approval, samples of all materials specified to be used in the project.
1. For samples of materials involving electrical work of any nature, see the General Electrical Requirements.
 2. Samples shall be in triplicate, of sufficient size to show the quality, type, range of color, finish and texture of the material. However, in addition thereto, after approval, three (3) additional samples showing the material, color and texture of all interior finishes, including the finishes of exposed built-in equipment, trim, glazing, fittings and fixtures, etc., shall also be furnished. The sizes of these additional samples shall be as directed by and acceptable to the Commissioner.
 3. Each of the samples shall be labeled, bearing the name and quality of the material, the Contractor's name, date, Contract and project, and the related Specification or Contract Drawing reference to the samples submitted.
 4. A letter of transmittal, in triplicate, from the Contractor requesting approval must accompany all such samples.
 5. Transportation charges to the Commissioner's office must be prepared on all samples forwarded.
 6. Samples for testing purposes shall be as required in the Specifications.
- J. **SAMPLES ON DISPLAY** - When samples are specified to be equal to samples in the office of the Commissioner, they shall be carefully examined by the bidders and by those whom the bidder expects to employ for the furnishing of such materials.
- K. **TIMELY SUBMISSIONS LOG/SCHEDULE** - Samples shall be submitted in accordance with approved Shop Drawing log so as to permit proper consideration without delaying any operation under the project. Materials should not be ordered until approval is received, in writing, from the Commissioner. All materials shall be furnished equal in every respect to the approved samples.

- L. **THE APPROVAL OF ANY SAMPLES** - will be given as promptly as possible, and shall be only for the characteristic color, texture, strength, or other feature of the material named in such approval, and no other. When this approval is issued by the Commissioner, it is done with the distinct understanding that the materials to be furnished will fully and completely comply with the Specifications, the determination of which may be made at some later date by a laboratory test or by other procedure. Use of materials will be permitted only so long as the quality remains equal to the approved samples and complies in every respect with the Specifications, and the colors and textures of the samples on file in the Office of the Commissioner, for the project.
- M. **ACCEPTIBILITY OF TEST DATA** - The Commissioner will be the final judge as to acceptability of laboratory test data and performance in service of materials submitted.
- N. **VALUABLE SAMPLES** - such as hardware, plumbing and electrical fixtures, etc., not destroyed by inspection or test, will be returned to the Contractor and may be incorporated into the work after all questions of acceptability have been settled, providing suitable permanent records are made as to the location of the samples, their properties, etc.
- O. **EQUIVALENT QUALITY OF MATERIALS** - All materials and equipment which are designated in the Specifications by a number in the catalogue of any manufacturer or by a manufacturer's grade or trade name, are designated for the purpose of describing the article and fixing the standard or the quality and finish. Materials and equipment, which are, in the opinion of the Commissioner, the equivalent to that specified, will be acceptable.
- P. The submission of any material, or article, as the equal of the materials or articles set forth in the Specifications as a standard shall be accompanied by illustrations, drawings, descriptions, catalogues, records of tests, samples and any and all other information essential for judging the equality to the materials, finish and durability of that specified as standard, as well as information indicating satisfactory use under similar operating conditions.
- Q. **MANUFACTURER'S DIRECTIONS** - Where the Specifications provide that the manufacturer's directions are to be used, such printed directions shall be submitted to the Commissioner.
- R. **COMMISSIONER TO SELECT INSPECTORS** - Except as specifically provided in the Specifications, the Commissioner will select and designate all persons, firms, or corporations to make or witness each and every inspection, test or analyses, with or without reports.
- S. **NOTICE** - The Contractor shall give notice in writing to the Commissioner sufficiently in advance of its intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Commissioner will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials, or the Commissioner will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or the Commissioner will notify the Contractor that inspection will be waived.
- T. **NO SHIPPING BEFORE INSPECTION** - The Contractor shall comply with the foregoing before shipping any material.
- U. **CERTIFICATE OF MANUFACTURE** - When the Commissioner so requires, the Contractor shall furnish to the Commissioner authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Specifications. These certificates shall include copies of the results of physical tests and chemical analyses where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. This may include such approvals as B.S.A., M.E.A., B.E.C. Advisory Board, etc.

- V. **ACCEPTANCE** - When materials or manufactured products shall comprise such quantity that it is not practical to make physical tests or chemical analyses directly on the product furnished, a certificate stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Commissioner, be considered as the basis for the acceptance of such material or manufactured product.
- W. **TESTING COMPLIANCE** - The testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Specifications, indicating thereon all analyses and/or test data and interpreted results thereof.
- X. **REPORTS** - Six (6) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Commissioner as prerequisite for the acceptance of any material or equipment.
- Y. **REJECTIONS** - If, in making any test, it is ascertained by the Commissioner that the material or equipment does not comply with the Specifications, the Contractor will be notified thereof, and will be directed to refrain from delivering said materials or equipment, or to promptly remove it from the site or from the work and replace it with acceptable material without cost to the City.
- Z. **FURNISH DESIGNATED MATERIAL** - Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor shall immediately proceed to furnish the designated material or equipment.
- AA. **COST OF TESTS BORNE BY CITY** - Where the City directs test to be performed to determine compliance with the Specifications regarding materials or equipment, and where such compliance is ascertained as a result thereof, the City will bear the cost of such tests.
- BB. **COST OF TESTS BORNE BY CONTRACTOR** - Where tests are specifically called for in the Specifications to be made by the Contractor, the cost thereof shall be borne by the Contractor and shall be deemed to be included in the Contract price. The expenses of the testing personnel assigned by the City shall not be the Contractor's obligation. The Contractor shall reimburse the City for expenditures incurred in the making of tests on materials and equipment submitted by the Contractor as the equivalent of that specifically named in the Specifications and rejected for non-compliance.

1.07 Delivery of Materials

- A. **MATERIAL ORDERS** - The Contractor shall furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and shall also notify the Commissioner when materials have been delivered to the site and in what quantities.
- B. **AMPLE QUANTITIES** - The Contractor shall deliver materials in ample quantities to insure the most prompt and uninterrupted progress of the work so as to complete the work within the Contract time.
- C. **CONTAINERS** - The manufacturer's containers shall be delivered with unbroken seals and shall bear proper labels.
- D. **THE CONTRACTOR SHALL COORDINATE DELIVERIES** - in order to avoid delaying or impeding the progress of the work of any related Contractor.
- E. **STACKING** - All materials shall be properly stacked in convenient places adjacent to the site, or where directed, and protected in a satisfactory manner. Stacked materials shall be so arranged as to not interfere with visibility of traffic control devices.
- F. **OVERLOADING** - If authority is given to store materials in any part of the project area, they shall be so stored as to cause no overloading.
- G. **NO INTERFERENCE** - If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the work or interfering with the work to be done by any other Contractor, the relevant Contractor shall remove and restack such materials at no additional cost to the City.

1.08 Temporary Structures

- A. **FIELD OFFICE FOR CONTRACTOR** - The Contractor shall establish a temporary field office for its own use at the site during the period of construction, at which readily accessible copies of all Contract Documents shall be kept.
- B. The field office shall be located where it will not interfere with the progress of any part of the work or with visibility of traffic control devices.
- C. **CONTRACTOR'S REPRESENTATIVE** - In charge of each office there shall be a responsible and competent representative of the Contractor, duly authorized to receive orders and directions and to put them into effect.
- D. **TELEPHONE ARRANGEMENTS** - Arrangements shall be made by the Contractor whereby its representative may be readily accessible by telephone.
- E. **MATERIAL SHEDS** - used by the Contractor for the storage of its materials shall be kept at locations which will not interfere at any time with the progress of any part of the work or with visibility of traffic control devices.
- F. **SUBSTANTIAL CONSTRUCTION** - All temporary structures shall be of substantial construction and neat appearance, and shall be painted a uniform gray unless otherwise directed by the Commissioner.
- G. **ADVERTISING PRIVILEGES** - The City reserves the right to all advertising privileges. The Contractor shall not cause any signs of any kind to be displayed at the site unless specifically required herein or authorized by the Commissioner.
- H. **CONTRACTOR'S SIGN** - The Contractor shall post and keep posted, on the outside of its field office, office or exterior fence or wall at site of work, a legible sign giving full name of the company, address of the company and telephone number(s) of responsible representative(s) of the firm who can be reached in event of an emergency at any time.

1.09 Surveys (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **LINE AND GRADE** - The City will establish a baseline and bench mark near the site of the work for use of the Contractor in connection with the performance of the work.
- B. **RESPONSIBILITY** - The Contractor shall establish all other lines and elevations required for its work and shall be solely responsible for the accuracy thereof.
- C. **SAFEGUARD ALL POINTS** - Each Contractor shall safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the work, shall re-establish same if disturbed and bear the entire expense of rectifying the work improperly installed due to not maintaining, not protecting or removing without authorization such established points, stakes, or marks.
- D. **CITY MONUMENTS AND MARKS** - No work shall be performed near City monuments or marks so as to disturb them until the said monuments or marks have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.
- E. **FOUNDATIONS** - The Contractor for General Construction Work shall furnish certification from a licensed Surveyor that all portions of the foundation work are located in accordance with the Contract Drawings and at the elevations required thereby. This certification shall show the actual locations and the actual elevations of all the work in relation to the locations and elevations shown on the Contract Drawings, including but not restricted to the following:
 - 1. The locations and elevations of all piles, if any.

2. Elevations of tops of all spread footings, tops of pile caps, and tops of all foundation walls, elevator pit walls and ramp walls.
 3. Location of all footing centers and pier centers including those for exterior wall columns.
 4. Location of all foundation walls including wall columns, elevator pit walls and ramp walls.
- F. **WALL LINES** - After the first courses of masonry or stone have been laid, the Contractor for General Construction Work shall establish the permanent lines of exterior walls. Such Contractor shall furnish promptly, certification from a licensed Surveyor, in the form of signed original drawings showing the exact location of such wall lines, of all portions of all structures. Except at its own risk, the Contractor for General Construction Work shall not proceed further with the erection of walls until the Surveyor's certification has been submitted and verified for correct location of wall lines.
- G. **SURVEYOR** - The Surveyor selected for any of the purposes mentioned in Paragraph E and Paragraph F above, and Paragraph I below, shall be a licensed Surveyor and shall be subject to the approval of the Commissioner. The Surveyor shall not be a regular employee of the Contractor, nor shall the Surveyor have any interest in the Contract. The Surveyor shall not be employed by the Contractor in laying out any work, it being intended that the Surveyor's certification shall represent an independent and disinterested verification of such layout. The Surveyor shall report to the Department of Design and Construction's Resident Engineer each time upon arrival to and departure from the site and review with the Resident Engineer the data required for the project.
- H. **FINAL CERTIFICATION** - Final certification shall be submitted upon completion of the work or upon completion of any subdivision of the work as directed by the Commissioner. Any exceptions or deviations from the drawings shall be noted on the final certificate and there shall be included any maps, plates, notes, pertinent documents and data necessary, in the opinion of the Commissioner, to constitute a full and complete report.
- I. **FINAL SURVEY** - The Contractor for General Construction Work shall submit to the Department of Design and Construction for submission to the Department of Buildings a final Survey by the licensed Surveyor showing the location of the new Structure, before completion of the Structure. This Survey shall show the location of the first tier of beams or of the first floor; the finish grades of the open spaces on the plot; the established curb level and the location of all other Structures on the plan, together with the location and boundaries of the lot or plot upon which the Structure is constructed, curb cuts, all yard dimensions, etc.

1.10 Contractor's Superintendent

- A. **SUPERINTENDENT** - The Contractor shall devote its time and personal attention to the work and shall employ and retain at the project site, from the commencement until the entire completion of the work, a Contractor's Superintendent competent and capable of maintaining proper supervision and care of the work and acceptable to the Commissioner, who, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any subcontractor, shall see that the instructions of the Commissioner are carried out.
- B. **REPLACEMENT** - The Contractor's Superintendent on the job shall not be changed or removed without the consent of the Commissioner.

1.11 Permits

The Contractor shall comply with all local, state and federal laws, rules and regulations affecting the Work of this Project, including, without limitation, (1) obtaining all necessary permits for the performance of the Work prior to commencement thereof, and (2) complying with all requirements for the disposal of demolition and/or construction debris, waste, etc., including disposal in City landfills. The Contractor shall be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

1.12 Transportation

- A. **AVAILABILITY** - It shall be the duty of the Contractor to determine the availability of transportation facilities and dockage for the use of its employees, equipment and material and the conditions under which such use will be permitted.
- B. **COSTS** - If transportation facilities and dockage are available and are permitted to be used by the governmental agency having jurisdiction, the Contractor shall pay all necessary costs and expenses, and abide by all rules and regulations promulgated in connection therewith.
- C. **VEHICLES** - With respect to the use of vehicles on highways and bridges, the Contractor's attention is directed to the limitations set forth in the Rules of the City of New York, Title 34, Chapter 4, Section 4-15.
- D. **CONTINUED USE** - It is understood that the Commissioner makes no warranty as to the continued use by the Contractor of such facilities.

1.13 Sleeves And Hangers (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **COORDINATE TO PROGRESS SCHEDULE** - Contractors required to furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment necessary to be built into the work to be performed by the Contractor for General Construction Work, shall promptly furnish and set such sleeves or other materials in conformity with the requirements of the project.
- B. **COOPERATION OF CONTRACTORS** - All Contractors shall fully cooperate with each other in connection with the performance of the above work as "cutting in" new work is neither contemplated nor will it be tolerated.
- C. **TIMELINESS** - In the event that timely delivery of sleeves and other materials cannot be made, and to avoid delay, the affected Contractor may arrange to have boxes or other forms set at the locations where the piping or other material is to pass through or into the slabs, walls or other work. Upon the subsequent installation of the sleeves or other material, the Contractor for General Construction Work shall fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in shall be borne by the Contractor or Contractors responsible therefore.
- D. **INSERTS** - The Contractor for General Construction Work is to install strip inserts four (4) foot on center and perpendicular to beams in ceiling slabs of boiler, machine and mechanical equipment rooms. Inserts are to be installed for strippable concrete slabs only.

1.14 Cutting And Patching

- A. **RESPONSIBILITY** - Each Contractor shall do all cutting, patching and restoration required by its work, unless otherwise particularly specified in the Specifications of its Contract.
- B. **RESTORE WORK** - Each Contractor shall restore any work they damage that is the work of another Contractor.
- C. **COMPETENT WORKERS** - All restoration work shall be done to the satisfaction of the Commissioner by competent workers skilled in the trade required by such restoration. If, in the judgment of the Commissioner, workers engaged in restoration work are incompetent, they shall be replaced immediately by competent workers.
- D. **REMOVALS** - Each Contractor must remove from the premises all demolished materials of every nature or description resulting from cutting, patching and restoration work, in accordance with the requirements hereinafter stipulated under article on REMOVAL OF RUBBISH AND SURPLUS MATERIALS.

1.15 Temporary Heat (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

A. GENERAL

1. Definition - The provision of Temporary Heat shall mean the provision of heat in order to permit construction to be performed in accordance with the Progress Schedule during all seasons of the year and to protect the work from the harmful effects of low temperature. In the event the building, or any portion thereof, is occupied during construction, the provision of Temporary Heat shall include the provision of heat to permit normal operations in such occupied areas.
 - a. The provision of Temporary Heat shall be in accordance with the temperature requirements set forth in Paragraph (c) below.
 - b. The provision of Temporary Heat shall include the provision of: 1) all fuel necessary and required, 2) all equipment necessary and required, and 3) all operating labor necessary and required. Operating labor shall mean that minimum force required for the safe day to day operation of the system for the provision of Temporary Heat and shall include, without limitation, heating maintenance labor and/or Firewatch as required by NYC Fire Department regulations. Operating labor may be required seven (7) days per week and during other than normal working hours, for the period of time required by seasonal weather conditions.
 - c. In the event the building, or any portion thereof, is occupied and the Project involves the replacement, modification and/or shut down of the permanent heating system, or any key component thereof; and such system is a combined system which furnishes domestic hot water for the building occupants, the provision of Temporary Heat shall include the provision of domestic hot water at the same temperature as the system which is being replaced. Domestic hot water shall be provided in accordance with the phasing requirements set forth in the Contract Documents.
2. Responsibility - The Contractor responsible for the provision of Temporary Heat, and all expenses in connection therewith, shall be as set forth below.
 - a. Projects Involving Enclosure of the Building
 - (1) Prior to Enclosure - Until the Commissioner determines that the building has been enclosed, as set forth in Paragraph (b) below, each Contractor shall be responsible for the provision of its own Temporary Heat.
 - (2) Post Enclosure - Once the Commissioner determines that the building, or any portion thereof, has been enclosed, as set forth in Paragraph B below, the Contractor for Heating, Ventilating and Air Conditioning Work ("HVAC Work") shall be responsible for the provision of Temporary Heat by one or more of the following means: 1) by an existing heating system (if any), 2) by a permanent heating system which is being installed as part of the Project, or 3) by a temporary heating system(s). The Contractor for HVAC Work shall, within two (2) weeks of the kick-off meeting, submit to DDC for review its proposed plan to provide Temporary Heat. Such plan is subject to approval by the Resident Engineer. The Contractor for HVAC Work shall provide Temporary Heat in accordance with the approved plan until written acceptance by the Commissioner of the work of all Contractors, including punch list work, unless directed otherwise in writing by the Commissioner. The responsibility of the Contractor for HVAC Work provided for herein is subject to the exception set forth in Paragraph H.3.b.(2) below.
 - b. Projects not involving Enclosure of the Building
 - (1) If the Project involves the installation of a new permanent heating system if one did not exist previously, or the replacement, modification and/or shut down of the existing

permanent heating system, or any key component thereof, the Contractor for HVAC Work shall be responsible for the provision of Temporary Heat, except as otherwise provided in Paragraph H.3.b.(2) below.

- (2) If the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification and/or shut down of the existing permanent heating system, or any key component thereof; there is no Contractor responsibility of the provision of Temporary Heat, unless otherwise specified in the Contract Documents. However, if the Commissioner, pursuant to Paragraph H.3.b.(1) below, determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor for HVAC Work shall be responsible for the provision of Temporary Heat and such Contractor shall be paid for the same in accordance with Paragraph H.3.b.(1).

B. ENCLOSURE OF STRUCTURES

1. Notification - The Contractor for General Construction Work shall notify all other Contractors and the Resident Engineer at least 30 days prior to the anticipated date that the building(s) will be enclosed.
2. Commissioner Determination - The Commissioner shall determine whether the building, or any portion thereof, has been enclosed. As indicated in Paragraph A above, once the building has been enclosed, the Contractor for HVAC Work shall be responsible for the provision of Temporary Heat. The Commissioner's determination with respect to building enclosure shall be based upon all relevant facts and circumstances, including without limitation, 1) whether the building meets the criteria set forth in Paragraph 3 below, and 2) whether the openings in the building, such as doorways and windows, have been sufficiently covered so as to provide reasonable heat retention and protection from the elements.
3. Criteria for enclosure
 - a. Roof Area
 - (1) A building shall be considered to be roofed when the area to be roofed is covered by a permanent structure and all openings through the permanent structure are covered and protected by temporary covers in Paragraph (c) below.
 - (2) Intermediate floor structures of multi-floor buildings shall be considered to be roofed subject to the same requirements of the building roof.
 - (3) The final roofing system need not be in place for the building or structure to be determined to be enclosed; provided, however, all openings through the permanent structure covering the roof must be covered and protected by temporary covers, as described in Paragraph (c) below.
 - b. Walls - For the walls to be determined to be enclosed, permanent exterior wall elements or facing material must be in place and all openings must be covered and protected by temporary covers, as described in Paragraph (c) below.
 - c. Temporary Covers - In order to be acceptable, temporary covers must be securely fixed to prevent the entrance of rain, snow and direct wind. The minimum material requirements for temporary covers are as follows: 1) minimum 10 mil. plastic, 2) minimum 12 ounce waterproof canvas tarpaulins, or 3) a minimum three-eighths (3/8) inch thickness exterior grade plywood.
 - d. Temporary covers for openings shall be the responsibility of the Contractor for General Construction Work, and such work shall be deemed included in the Contractor for General Construction Work's bid price.

C. TEMPERATURE REQUIREMENTS

1. Unoccupied Buildings - The temperature requirement for the provision of Temporary Heat in unoccupied buildings shall be the GREATER of the following: 1) 50 degrees Fahrenheit, or 2) the temperature requirement for the particular type of work set forth in the Contract Documents.
2. Occupied Buildings - The temperature requirement for the provision of Temporary Heat in occupied buildings, or portions thereof, shall be the GREATER of the following: 68 degrees Fahrenheit or the temperature requirement for the particular type of work set forth in the Contract Documents.

D. DURATION

1. The Contractor for HVAC Work shall be required to provide Temporary Heat until written acceptance by the Commissioner of the work of all Contractors, including punch list work, unless directed otherwise in writing by the Commissioner. The Contractor for HVAC Work shall be responsible for the provision of Temporary Heat for the time specified herein, regardless of any delays in completion of the Project, including delays that result in the commencement of the provision of Temporary Heat during a season that is later than that which may have been originally anticipated. The Contractor for HVAC Work shall include in its Total Bid Price all expenses in connection with the provision of Temporary Heat in accordance with the requirements specified herein.
2. The total Contract duration is set forth in consecutive calendar days in Schedule A of the General Conditions. The Table set forth below indicates the number of full heating seasons that are deemed included in various contract durations, which are specified in consecutive calendar days (ccds). At a minimum, a full heating season shall extend from October 15th to April 15th.

Contract Duration	Full Heating Seasons Required
up to 360 ccds	1 full heating season
360 to 720 ccds	2 full heating seasons
more than 720 ccds	3 full heating seasons

E. METHOD OF TEMPORARY HEAT

1. The method of temporary heat shall be in conformance with all applicable laws, rules and regulations. Prior to implementation, such method shall be subject to the written approval of the Commissioner.
2. The method of temporary heat shall:
 - a. Not cause the deposition of dirt or smudges upon any finished work or cause any defacement or discoloration to the finished work.
 - b. Not be injurious or harmful to people or materials.
3. No open fires will be permitted.
4. Electric heating will not be permitted unless required by Contract Documents and Specifications or otherwise approved by the Commissioner.
5. Direct-fired equipment will be allowed in construction areas where the use of such equipment will not damage or deteriorate the construction or finishes or be harmful to persons working in the area.

F. TEMPORARY HEATING SYSTEM

1. The temporary system for the provision of Temporary Heat provided by the Contractor for HVAC

Work following enclosure of the building shall be complete including, but not limited to, torpedo blowers and/or propane heaters subject to provisions of paragraph E above), boilers and fuel storage, pumps, radiators, unit heaters, water and heating piping, insulation and controls. The temporary system for the provision of Temporary Heat shall be capable of maintaining the minimum temperature requirements set forth in Paragraph C above.

G. THE CONTRACTOR FOR GENERAL CONSTRUCTION WORK

1. The Contractor for General Construction Work shall coordinate with the Contractor for HVAC Work in the work of providing Temporary Heat, and shall so coordinate its operations as to insure sufficient and timely performance of the work under all Contracts. The Contractor for General Construction Work shall supply and pay for all water required and used in the building for the operation of the heating system(s) for the purpose of Temporary Heat. The Contractor for General Construction Work shall include all expenses in connection with the supply of water for Temporary Heat in its Total Bid Price. During the period in which Temporary Heat in an enclosed building is being furnished and maintained by the Contractor for HVAC Work, the Contractor for General Construction Work shall, in order to provide proper ventilating and drying, open and close the windows and other openings when necessary for the proper execution of the work and also when directed by DDC. The Contractor for General Construction Work shall maintain all permanent or temporary enclosures at its own expense.

H. THE CONTRACTOR FOR HVAC WORK

1. Use of Permanent Heating System for Temporary Heat after Building Enclosure

- a. The Contractor for HVAC Work shall provide all labor and materials to promptly furnish and set all required equipment and convectors and/or radiators, piping, valves, fitting, etc., in ample time for their use for the provision of Temporary Heat after enclosure of the building.
- b. New portions of the permanent heating system that are used for furnishing Temporary Heat shall be left in near perfect condition when delivered to the City for operation. Any repairs required, other than for ordinary wear and tear on the equipment, shall be made by the Contractor for HVAC Work at his expense. The starting date for the warranty or guarantee period for such equipment shall be the date of Substantial Completion acceptance.
- c. In the event that the Contractor for HVAC Work does not advance the installation of the permanent heating system in sufficient time to permit its use for Temporary Heat as determined by DDC, the Contractor for HVAC Work shall furnish and install a separate system for the provision of Temporary Heat as required to maintain the minimum temperature requirements set forth in Paragraph C above.

2. All equipment for the system for the provision of Temporary Heat shall be placed so as to comply with the requirements specified hereinbefore, and shall be connected, disconnected and suitably supported and located so as to permit construction work, including finish work such as wall plastering and painting, to proceed. The installation of the system for the provision of Temporary Heat by the Contractor for HVAC Work, including the placing of ancillary system equipment, shall be coordinated with the operations of all Contractors so as to insure sufficient and timely performance of the work of all Contractors. Once the permanent heating system is operating properly, the Contractor for HVAC Work shall remove all portions of the system for Temporary Heat which are not part of the permanent heating system.

3. Temporary Heat Allowance for Special Conditions or and/or Unforeseen Circumstances.

- a. The City has established an allowance in the Contract for HVAC Work for payment of costs and expenses in connection with the provision of Temporary Heat as set forth herein. The amount of such allowance is set forth on the Bid Form for the Contract for HVAC Work and shall be included in the Total Bid Price of the Contractor for HVAC Work. The Contractor for HVAC Work shall only be entitled to payment from this allowance under the conditions and in

accordance with the requirements set forth below. In the event this allowance or any portion thereof remains unexpended at the conclusion of the Contract, such allowance shall remain the sole property of the City. Should the amount of the allowance be insufficient to provide payment for the expenses specified below, the City will increase the amount of the allowance.

b. The allowance set forth herein may be utilized only under the conditions set forth below.

(1) In the event the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification and/or shut down of the existing permanent heating system, or any key component thereof, and the Commissioner determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor for HVAC Work shall be responsible for the provision of Temporary Heat, as directed by the Commissioner. The City shall pay such Contractor for all costs for labor, material, and equipment necessary and required for the same. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall be as set forth in Paragraph (c) below.

(2) In the event that after enclosure of the building, the Commissioner determines that (i) Contractors other than the Contractor for HVAC Work have not sufficiently advanced the work of their contracts that is necessary and required to permit the Contractor for HVAC Work to use the permanent or other heating equipment for the provision of Temporary Heat, and (ii) the Contractor for HVAC Work does not bear any responsibility for such other Contractors' failure to advance the work, the City shall pay the Contractor for HVAC Work for all differential costs for labor, material, and equipment necessary and required for the provision of a substitute system(s) for the provision of Temporary Heat or portions thereof in lieu of the permanent or other systems intended for Temporary Heat. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall be as set forth in Paragraph (c) below.

(3) In the event the Commissioner determines that there is a need for maintenance of the permanent heating system by the Contractor for HVAC Work after written acceptance by the Commissioner of the work of all Contractors, and that the need for such maintenance is not the fault of the Contractor for HVAC Work, the Contractor for HVAC Work shall provide the required maintenance of the permanent heating system for the period of time directed by the Commissioner. The City shall pay the Contractor for HVAC Work for the cost of direct labor and fuel necessary and required in connection with such maintenance, excluding the cost of any foremen or other supervision. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall be as set forth in Paragraph (c) below.

c. Payment for Fuel Costs - Payment from the allowance set forth herein for the cost of fuel necessary and required to operate the system for the provision of Temporary Heat or to maintain the permanent heating system under the conditions set forth in Paragraph b above shall be limited to the direct cost of such fuel. The Contractor for HVAC Work shall not be entitled to any overhead and/or profit for such fuel costs. In order to receive payment for such fuel costs, the Contractor for HVAC Work must present original invoices for the same. DDC reserves the right to furnish the required fuel.

d. Deduction - In the event that any amount of the allowance set forth herein is expended for payment to the Contractor for HVAC Work under the circumstances set forth in Paragraph b.(2) above, the Commissioner shall deduct and retain such amount out of moneys that are due and owing hereunder to the other Contractor(s) responsible for the failure to advance the work, as determined by the Commissioner. In the event the amount expended from the allowance exceeds the total sum due and owing to such other Contractor(s), such excess shall be paid to the City by such other Contractor(s) immediately upon demand.

I. THE CONTRACTOR FOR ELECTRICAL WORK

1. The Contractor for Electrical Work shall be responsible for providing the items set forth below and shall include all expenses in connection with such items in its Total Bid Price. The Contractor for Electrical Work shall provide such items promptly when required and shall in all respects coordinate its work with the Contractor for General Construction Work and the Contractor for HVAC Work in order to facilitate the provision of Temporary Heat by the Contractor for HVAC Work.
 - a. The Contractor for Electrical Work shall provide all labor, materials, equipment and power necessary and required to furnish and maintain any temporary or permanent electrical connections to all equipment specified to be connected as part of the work of his Contract.
 - b. The Contractor for Electrical Work shall supply and pay for all power necessary and required for the operation of the system for the provision of Temporary Heat and/or the permanent heating system used for Temporary Heat by the Contractor for HVAC Work. Such power shall be provided by the Contractor for Electrical Work for the duration the Contractor for HVAC Work is required to provide Temporary Heat, as set forth in Paragraph D above.
2. In providing the items set forth in Paragraph 1 above, the Contractor for Electrical Work is advised that labor may be required seven (7) days a week and/or during other than normal working hours for the period of time required by seasonal weather conditions.

J. THE CONTRACTOR FOR PLUMBING WORK

1. The Contractor for Plumbing Work shall be responsible for providing all labor, materials and equipment necessary and required to furnish and maintain all temporary or permanent connections to all equipment or plumbing outlets specified to be provided as part of the work of his Contract. The Contractor for Plumbing Work shall include all expenses in connection with such items of work in its Total Bid Price. The Contractor for Plumbing Work shall provide such items of work promptly when required and shall in all respects coordinate its work with the Contractor for General Construction Work and the Contractor for HVAC Work in order to facilitate the provision of Temporary Heat by the Contractor for HVAC Work.
2. In the event portions of the permanent plumbing equipment furnished by the Contractor for Plumbing Work as part of the work of his Contract are used for the provision of Temporary Heat by the Contractor for HVAC Work, either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor for Plumbing Work shall be responsible to provide such plumbing equipment to the City in near perfect condition and shall make any repairs required, other than for ordinary wear and tear on the equipment, at his expense. The starting date for warranty and/or guarantee period for such plumbing equipment shall be the date of Substantial Completion acceptance by the City.
3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor for Plumbing Work shall promptly perform all required filings and coordination with the Utility Companies in order to expedite the installation, testing, and approval of the gas service and associated meter(s).

1.16 Scaffolding and Platforms

A. CONFORMANCE: Unless otherwise indicated, the Contractor for General Construction is responsible for providing, erecting, installing and maintaining all temporary scaffolding and platforms which shall comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the NYC Building Code, NYC Local Law 52 of 2005, OSHA Construction Standard 1926 Subpart L, and furnishing the following items.

B. RESPONSIBILITY

1. A Jobsite Monitor who shall be a competent person, designated and employed by the contractor who has a daily presence on the site during scaffold use. This designee must possess and

maintain a valid New York City Department of Buildings supported scaffold certificate of completion. An alternate shall also be designated, in the event that the Jobsite Monitor is absent. The Jobsite Monitor shall:

- a. Verify completeness of documentation and submittals (as described below).
 - b. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected.
 - c. Monitor trades using scaffold.
 - d. Limit access to scaffold areas that are tagged for non-use.
 - e. Inform trades of scaffold load limitations.
 - f. Monitor loading of decks.
 - g. Verify that any ties that are temporarily removed are properly restored in the same shift.
 - h. Verify that outriggers and planks that are moved are properly set up and secured.
 - i. Verify that all scaffold decks in use have proper access/egress.
 - j. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards.
 - k. Notify appropriate parties, including but not limited to the Resident Engineer, site safety coordinator / monitor, site safety consultant, scaffold users, contractor and the scaffold engineer, of misuses, non-conformances, hazards and accidents.
 - l. Keep a log of significant actions and events connected with the scaffolding.
2. The Contractor shall be responsible for erection, maintenance and dismantling of the scaffold / shed in conformance with the New York City Building Code and OSHA requirements, contract documents and engineering specifications. The Contractor shall also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.
3. Scaffold Engineer is a New York State licensed PE engaged by the scaffold contractor / erector and responsible to ensure that the installation design conforms to the New York City Building Code and OSHA requirements, that the design comports with the capabilities of the components and the characteristics of the site, that scaffold loads on the host building, including netting, have been properly considered and that the design documents communicate information for erectors and users.
4. Scaffold users are trade contractors assigned to work on the scaffold. Training certificates from a New York City Department of Buildings approved training provider are mandatory. These users have the duty to become familiar with the New York City Building Code and OSHA requirements germane to users, to obey the instructions of the Jobsite Monitor and inform the Jobsite Monitor of known hazards, non-conformances or violations.

C. JOBSITE DOCUMENTATION AND SUBMITTALS:

1. NYC Department of Buildings permit(s) for scaffold and sidewalk sheds (as applicable) including filing applications signed and sealed by A Professional Engineer licensed in the State of New York;
2. Site logistics plan / site safety plan;
3. Installation drawing(s), design and product data to be provided for all scaffold(s) and shed(s) must include, at a minimum:
 - a. Plan(s);
 - b. Elevation(s);
 - c. Duty load designation; "standard" (150 psf live load) or "heavy duty" (300 psf live load).
 - d. Details including base support, anchors and ties;
 - e. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal.
 - f. Anchorage into sound material.
 - g. Load limits-based on pull tests;
 - h. Specifications for pull test(s), method, proof load and the number of trials;
 - i. Elevations, levels or heights, where anchorage is made into masonry;

- j. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
- k. Samples for anchors, ties and netting;
- l. Sequence of operations for erection and demolition;
- m. Location plan, heights, widths, "jumps" over doorways and driveways;
- n. Specify size, maximum span and maximum spacing of headers and stringers;
- o. Specify legs, girts, braces, nailing and connections;
- p. All sidewalk sheds shall be designed, engineered, signed and sealed by a Professional Engineer licensed in the State of New York;
 - 1) Generic (not job specific) engineering drawings are satisfactory for standard sheds and arrangements.
 - 2) Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

D. INSPECTIONS:

- 1. Signed inspection reports shall be issued for each inspection and pull-test below, and shall be logged and maintained on site by the Jobsite Monitor for the duration of the project.
- 2. Pull testing shall be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer shall specify the test method, proof load and the number of trials.
- 3. Sidewalk sheds shall be inspected after initial installation, major modification, or damage and thence every three months. Inspections shall be by a Scaffold Engineer for custom sheds and by a competent person employed by the Contractor for standard sheds.
- 4. Scaffolds shall be inspected by the Scaffold Engineer during erection, post-erection and prior to use and thence every three months. The Scaffold Engineer shall repeat inspections after major alteration/modification, damage.
- 5. A qualified person assigned by the Contractor shall inspect the progress of erection and dismantling, and the condition and integrity of the sidewalk sheds after high winds, major storms and at least once per month during usage.
- 6. A qualified person assigned by the Contractor shall inspect the progress of erection and dismantling at least weekly, and the condition and integrity of the scaffold after high winds, major storms and at least once per month during usage.
- 7. Scaffolds shall be inspected daily by the Jobsite Monitor or alternate prior to use by scaffold users.
- 8. At the completion of the project, submit all inspection documents to the Commissioner for record purposes.

E. LADDERS AND STAIRS: The Contractor for General Construction Work shall provide and maintain ladders or temporary stairs extending from the street to the first story, and to and from every floor and roof level of the project.

F. ACCESS AND EXITS: The ladders or temporary stairs shall be of acceptable size, number and location, so that proper and convenient access may be had by those required to proceed to and from all parts of the project.

1.17 Hoists and Hoistways

A. RESPONSIBILITY - The Contractor for General Construction Work shall provide adequate numbers of material hoists for the most expeditious performance of all parts of its work. All other Contractors are required to provide their own facilities for the hoisting of materials under their respective Contracts. However, these Contractors may make arrangements, whenever possible, with the Contractor for General Construction Work for the use of its hoist upon such terms and conditions as it may prescribe.

- B. LOCATIONS - No hoists shall be constructed at such locations as will interfere with, or affect the construction of, floor arches, or the work of other Contractors. The hoists may be located at the exterior sides of the structure or in the courtyard and extend upward adjacent to the line of window openings. The hoists shall be located a sufficient distance from the exterior walls and be so protected as to prevent any of the permanent work from being damaged, stained or marred.
- C. ELEVATOR SHAFT - Wherever possible, one or more of the permanent elevator shafts may be used as temporary hoistways providing such use meets with the Building Code of the City of New York and the approval of the Commissioner, and providing further it entails no interference with the progress of the work of any Contractor.
- D. PROTECTION FOR INTERIOR HOISTS - All interior material hoistways shall be enclosed on each floor and shall be adequately protected with appropriate safety guards. In no event shall the protection be less than that required by law.

1.18 Certificates of Approval

- A. RESPONSIBILITY - Each Contractor shall be responsible for and shall obtain all final approvals for the work installed under its Contract in the form of such certificates that are required by all governmental agencies having jurisdiction over the work of the Contract.
- B. TRANSMITTAL - All such certificates shall be forwarded to the Commissioner through the Resident Engineer before final acceptance of the work of the Contract.

1.19 Acceptance Tests

- A. GOVERNMENTAL AGENCIES - All equipment and appliances furnished and installed under the Contract shall conform with the requirements of the Specifications, and shall in no event be less than that necessary to comply with the minimum requirements of the law and all of the governmental agencies having jurisdiction.
- B. NOTICE OF TEST - Whenever the Specifications and/or any governmental agency having jurisdiction requires the acceptance test, the Contractor shall give written notice to all concerned of the time when these tests will be conducted.
- C. ENERGY - The City will furnish all energy, fuel, water and light required for tests.
- D. LABOR AND MATERIALS - The Contractor shall furnish labor and all other material and instruments necessary to conduct the acceptance tests at no additional cost to the City.
- E. CERTIFICATES - The final acceptance by the Commissioner shall be contingent upon the Contractor delivering to the Commissioner all necessary certificates evidencing compliance in every respect with the requirements of the regulatory agencies having jurisdiction.
- F. RESULTS - If the results of tests and Controlled Inspections indicate that the material or procedures do not meet requirements as set forth on the Contract Drawings or in the Specifications or are otherwise unsatisfactory, the Contractor shall only proceed as directed by the Resident Engineer. Additional costs resulting from retesting, reinspecting, replacing of material and/or damage to the work of other trades and any delay caused to the schedule shall be borne by the Contractor.

1.20 Progress Photographs (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. PHOTOGRAPHER - The Contractor for General Construction Work shall employ and pay for the services of a competent photographer who shall take photographs showing the progress of the work.
- B. PHOTOGRAPHS - There shall be four (4) photographs taken each month from the commencement of the Contract to the time of completion. These photographs shall show as far as possible, the work

completed within and on the exterior of the structure. The first series of photographs shall be taken prior to the actual commencement of work at the site. In addition thereto before final payment, there shall be six (6) photographs taken of unobstructed views of the completed project or projects and site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning done. (For demolition work included in the Contract there shall be four (4) photographs taken before commencement of demolition operations; four (4) at the mid-point of operations; and four (4) at the completion of demolition operations). The prints shall be 8" x 10" gloss finish, mounted with a one (1) inch binding flap of muslin on the left side. They shall be marked on the back with date of exposure; the title of the project; and the specific location. Three (3) copies of each photograph shall be furnished free of charge to the Department of Design and Construction. Photographs shall be taken as ordered by the Commissioner.

1.21 Job Meetings

- A. **MEETINGS SCHEDULE** - Meetings shall be held as scheduled by the Resident Engineer in his office at the site, at which time Contractors for all separate Contracts shall have their representatives present to discuss all details relative to the execution of the work.
- B. **ACCOMODATIONS** - The Contractor for General Construction Work shall provide ample tables and chairs to accommodate all present at the meetings, and table space for Contract Drawings.
- C. **AGENDA** - The Resident Engineer shall preside over these meetings. Prior to each meeting, the Resident Engineer will consult with the Contractors and will prepare an agenda of items to be discussed. In general, after informal discussion of any item on the agenda, the Resident Engineer will summarize the discussion in a brief written statement, and each Contractor will then dictate a brief statement for the record.

The Contractor for General Construction Work shall furnish all necessary typing and printing of the minutes prepared by the Consultant Architect/Engineer. Ample copies of the printed minutes shall be furnished to the Resident Engineer for distribution to all Contractors and representatives of the Commissioner.

- D. **COORDINATION** - Job meetings shall also be called by the Contractor for General Construction Work for the purpose of coordinating, expediting and scheduling the work of all Contracts in accordance with the master coordinated Job Progress Chart. All Contractors and their subcontractors, material suppliers or vendors whose presence is necessary, are required to attend. These meetings may, at the discretion of the Contractor for General Construction Work, be held at the same place and immediately following the Job Meetings held by the Resident Engineer. Minutes of these meetings shall be recorded, typed and printed by the Contractor for General Construction Work and distributed to all parties concerned.

1.22 Guarantees and Warranties - Refer to the Addendum to the General Conditions for the applicability of this article.

- A. **SCHEDULE B** - Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum to the General Conditions.
- B. **FORM** - For all guarantee requirements set forth in Schedule B, the Contractor shall provide a written guaranty, in the form set forth on the following page.

GUARANTY

DDC PROJECT # _____

PROJECT DESCRIPTION _____

CONTRACT # _____

SPECIFICATION SECTION # AND TITLE _____

GUARANTY TO BE IN EFFECT FROM _____

TO _____

The Contractor hereby guarantees that the work specified under the above section of the aforesaid Contract will be free from defects of material and/or workmanship, for the period indicated above.

The Contractor also guarantees that it will promptly repair, restore, rebuild or replace whichever may be deemed necessary by the City, any or all defective material or workmanship of the aforementioned section, that may appear within the guaranty period and any finished work to which damage may occur because of such defects, to the satisfaction of the City and without any cost or expense to the City.

The Contractor hereby agrees to pay to the City the cost of the repairs or replacements should the City make the same because of the failure of the Contractor to do so.

Contractor

By

Subscribed and sworn to before me this

day of _____, year _____

Notary Public

1.23 Removal of Rubbish and Surplus Materials

- A. **RUBBISH** - Rubbish shall not be thrown from the windows or other parts of the project. Mason's rubbish, dirt and other dust-producing material shall be wetted down periodically.
- B. **LOCATION** - Each Contractor shall sweep up and deposit, at a location designated on each floor by the Contractor for General Construction Work, all of its rubbish, debris and waste materials, as it accumulates and when directed by the Resident Engineer. Wood cratings shall be broken up, neatly bundled, tied and stacked ready for removal and be deposited at a location designated on each floor by the Contractor for General Construction Work.
- C. **LABORERS** - The Contractor for General Construction Work shall be responsible for the removal of all rubbish, etc., from the site. The Contractor shall remove from the designated locations all piles of rubbish, debris, waste material and wood cratings as they accumulate and when directed by the Resident Engineer, and shall remove them from the site. The Contractor shall employ and keep engaged for this purpose an adequate number of laborers.
- D. **SURPLUS MATERIALS** - Each Contractor shall remove from the site all surplus materials when there is no further use for same.
- E. **TOOLS AND MATERIALS** - At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly removed.

1.24 Cleaning

Each Contractor shall thoroughly clean all equipment and materials furnished and installed and shall deliver such materials and equipment undamaged in a clean and new appearing condition at time of substantial completion.

1.25 Inspections by Other City Agencies

- A. **LETTER OF COMPLETION** - Just prior to substantial completion of this Project, the Commissioner will file with the Department of Buildings, an application for a Letter of Completion or a Certificate of Occupancy for the structure.
- B. **FINAL INSPECTIONS** - In connection with the above mentioned application for a Letter of Completion or a Certificate of Occupancy and before certificates of final payments are issued, each Contractor will be required to arrange for all final inspections by the inspectional staff of the Department of Buildings or other governmental agencies having jurisdiction, and secure all reports, sign offs, certificates, etc., by such inspection staff or other governmental agencies, in order that a Letter of Completion or Certificate of Occupancy can be issued promptly.

1.26 Security Guards/Fire Guards on the Site (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

A. SECURITY GUARDS (WATCHMEN)

- 1. The Contractor for General Construction Work shall provide competent Security Guards on the site until final completion of the project or earlier if so notified in writing by the Commissioner. The Security Service shall commence with the start of work. There shall be no less than one (1) Security Guard on duty every day, including Saturdays, Sunday and Holidays, 24 hours a day, except between the hours of 8:00 A.M. and 4:00 P.M. on any day which is a regular working day for a majority of the trades. This exception during the working day shall not apply after the finishing painting of the plaster work is commenced; thereafter, not less than one (1) Security Guard shall be on duty continuously, 24 hours a day, until final completion of the project or earlier if so notified in writing by the Commissioner.

2. Every Security Guard shall be required to hold a "Certificate of Fitness" issued by the Fire Department. Every Security Guard shall, during their tour of duty, perform the duties of Fire Guard in addition to their security obligations.
 3. Should the Commissioner find that any Security Guard is unsatisfactory, such guard shall be replaced by the Contractor for General Construction Work upon the written demand of the Commissioner.
 4. Each Security Guard furnished by the Contractor for General Construction Work shall be instructed by the Contractor for General Construction Work to include in their duties the entire construction site including the Field Office, temporary structures, and equipment, materials, etc.
 5. Should the Contractor for General Construction Work or any other Contractor consider the security requirements outlined above inadequate, it shall provide such additional security as it thinks necessary, after obtaining the written consent of the Commissioner. The additional cost of such approved increased protection will be paid by the Contractor who provides the additional protection.
 6. Nothing contained in this Article shall diminish in any way the responsibility of each Contractor for its own work, materials, tools, equipment, nor for any of the other risks and obligations outlined hereinbefore in this Article.
- B. **COSTS** - The Contractor for General Construction Work shall employ Security Guards/Fire Guards at all times, except as otherwise modified by the detailed Specifications and as approved by the Commissioner, for the purpose of safeguarding and protecting the site. All costs for Security Guards/Fire Guards shall be borne by the Contractor for General Construction Work.
- C. **RESPONSIBILITY** - All Contractors will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

1.27 Contractor's Daily Reports

- A. **DAILY REPORTS** - As soon as the Contractor has started work on the Project, it shall submit to the Resident Engineer written daily reports of the work performed the previous day by any of its employees, including the employees of its subcontractors.
- B. **INFORMATION** - The reports shall be prepared by the Contractor's Superintendent and shall bear the Contractor's Superintendent signature. Each report shall contain the following information:
1. The type of materials and/or major equipment being installed by the Contractor and the total number of employees working in each category on that particular day.
 2. The names of the subcontractors working and the type of materials and/or major equipment being installed by each, together with the total number of employees working for each subcontractor on that particular day.
 3. The major construction equipment being used by each Contractor and/or subcontractor.

1.28 Alternate or Substitute Equipment

- A. In general, the Contract Drawings and Specifications show and describe arrangements suitable for the specific items of equipment either named or described. In the event that a Contractor submits for approval, and receives such approval, a device or piece of equipment which requires connections (vacuum, gas, steam, water, air, electric, etc.) or arrangements of these services, differing from those indicated or described in the Contract Documents, it shall be incumbent upon the Contractor submitting the alternate or substitute equipment to give timely notice to the other Contractors involved so that they may make suitable alterations in the work to accommodate the substitute or alternate equipment. The Contractor making the substitution shall be responsible for any and all additional

costs incurred by any of the Contractors by virtue of the substitution of equipment for the equipment named or described in the Contract Documents.

1.29 Sleeve and Penetration Drawings (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. As soon as practicable after the commencement of work and when the order in which concrete for the first slabs, walls, etc. to be poured is determined, the Contractors for the engineering trades (Plumbing, Heating, Ventilating and Air Conditioning, and Electrical) shall submit to the Department of Design and Construction a sketch indicating the location and size of all penetrations for sleeves, ducts, etc. which will be required to accommodate the mechanical trades, in order that it may be determined if such penetrations will materially weaken the project's structure. The sketch will be stamped and returned if approved and/or comments will be transmitted. The engineering Contractors shall continue to submit sketches as the pouring schedule and the concrete work progresses and, until approvals for the penetration sketches have been given, shall not predicate their layout work on unapproved sketches.

1.30 Location of Partitions (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor for General Construction Work shall immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Resident Engineer.

1.31 Furniture and Equipment

- A. RESPONSIBILITY - Each Contractor is responsible for moving all loose furniture and/or equipment in all areas when such furniture and/or equipment interferes with the proper performance of its work.
- B. PROTECTION - All such furniture and/or equipment must be adequately protected with dust cloths and returned to their original locations when directed to do so by the Resident Engineer.

1.32 Overtime Work (Ordered by Commissioner)

- A. OVERTIME - The Commissioner reserves right to order and pay for overtime work.
1. The Commissioner can order overtime work when in the Commissioner's opinion, delay occurs and such delay is not the fault of the Contractor, or
 2. When work is of such an important nature that delay in carrying such work to completion would result in serious disadvantage to the public.
- B. ORDER FOR OVERTIME WORK - When overtime work is ordered by the Commissioner, such "Order" will be issued by the Commissioner on a special form letter over the signature of the Commissioner.
- C. CONTRACTOR'S PROCEDURE PRIOR TO COMMENCING WORK
1. Make immediate application to the Commissioner of Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.
 2. Upon receipt of such dispensation, proceed expeditiously with ordered overtime work.

1.33 Compliance with OSHA Regulations

These Contract Documents and the work hereby contemplated shall be governed, at all times, by the following Federal Laws:

- A. William Steiger Occupational Safety and Health Act of 1970, Public Law 91-596;

- B. Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations;
- C. Part 1926 - Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

1.34 Temporary Services

PART A (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **TEMPORARY WATER** - during construction shall be furnished in the following manner:
 - 1. Immediately after the Contractor for General Construction Work has been ordered by the Commissioner to start work, it shall file an application with the Dept. of Environmental Protection for the schedule of charges for water use during construction. The Contractor for General Construction Work will be responsible for payment of water charges.
 - 2. Immediately after the Contractor for Plumbing Work has been ordered by the Commissioner to start work, it shall file an application with the Department of Environmental Protection's Bureau of Water Supply and obtain its permit to install the temporary water supply system. The system shall be installed and maintained for the use of all Contractors. A copy of the above mentioned permit shall be filed with the Commissioner. The Contractor for Plumbing Work shall provide temporary water main, risers and waste stacks as directed and install on each floor, outlets with two (2) 3/4" hose valve connections over a barrel installed on a steel pan. The Contractor for Plumbing Work shall provide drains from the pans to the stack and house sewer and hose bibs to drain the water supply risers and mains. During winter months the Contractor for Plumbing Work shall take the necessary precautions to prevent the temporary systems from freezing.
- B. **TOILET FACILITIES** - both exterior and interior, for the use of all Contractors, shall be furnished and installed in the following manner:
 - 1. Toilet fixtures shall be furnished, installed and maintained in a satisfactory operating condition by the Contractor for Plumbing Work.
 - 2. Enclosures for the toilet fixtures shall be erected and maintained by the Contractor for General Construction Work.
 - 3. Heating for the enclosures shall be furnished, installed and maintained by the Contractor for General Construction Work.
 - 4. Electric lighting for the enclosures shall be furnished, installed and maintained by the Contractor for Electrical Work.
 - 5. The Contractor for General Construction Work shall keep the temporary toilet fixtures and enclosures in a clean and sanitary manner.
 - 6. No Contractor shall cause any sanitary nuisances to be committed by its employees in or about the work. Each Contractor shall enforce all sanitary regulations of the City and State Health Authorities.
- C. **OVERTIME USE** - Whenever any Contractor(s) work before or after the regular work hours hereinafter specified under Subparagraph D, or on a Saturday, Sunday or Holiday of any trade, such Contractor(s) shall pay the Contractor for Plumbing Work for the activation of the temporary water system and toilet facility services during such overtime periods. When more than one (1) Contractor is involved in overtime work, the costs thereof shall be prorated as determined by the Resident Engineer. When overtime is required by any or all Contractors on the work, the provisions for payment for regular time use of the temporary water supply system as specified in Subparagraph D shall apply.

- D. **ACTIVATION** - The Contractor for Plumbing Work shall bear the cost of keeping the temporary water supply system activated from a period of time 15 minutes before the established starting time of that trade which starts work earliest in the morning, to 15 minutes after the established quitting time of that trade which stops work latest in the evening. This applies to every day in the week which is established as a regular working day for aforementioned trades and holds until completion and final acceptance of the work of the Contractor for Plumbing Work or until the services are terminated by instructions from the Commissioner.

PART B (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **WATER** - The Contractor for General Construction Work will be responsible for payment of water charges. Billing will be in accordance with the Department of Environmental Protection schedule of charges for Building Purposes.
- B. **ELECTRICITY** - for temporary light and the operation of small tools, is available in the area of this project and will be furnished to the Contractor for General Construction Work by the Contractor for Electrical Work without cost.
- C. **TOILET FACILITIES** - The Contractor for General Construction Work shall arrange with the Commissioner for the temporary use of certain toilets or washrooms within the project for the use of all employees during the execution of the work.
- D. **MAINTENANCE** - The Contractor for General Construction Work shall maintain the temporary toilet facilities in a clean and sanitary manner and make all necessary repairs due to misuse.
- E. **NUISANCES** - The Contractors shall not cause any sanitary nuisance to be committed by its employees in or about the work, and shall enforce all sanitary regulations of the City and State Health Authorities.

1.35 Temporary Use, Operation and Maintenance of Elevators during Construction

PART A - FOR NEW BUILDINGS UP TO AND INCLUDING 15 STORIES (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **INSTALLATION** - The Contractor for General Construction Work shall install and complete, as indicated herein, one (1) selected main elevator in the Project for temporary operation by the Contractor for General Construction Work for the transporting of employees of all Contractors and representatives of the Department of Design and Construction and other Governmental Agencies having jurisdiction of work at the project. The Contractor for General Construction Work shall furnish, install and maintain for such elevators, all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.
- B. **RESPONSIBILITY** - The Contractor for General Construction shall be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith. The Contractor for General Construction shall employ and pay wages, including overtime wages if necessary, for all workers required for the operation and maintenance of the temporary elevator. The Contractor for General Construction shall be responsible for all costs for: (1) the installation of the temporary elevator, (2) maintaining the temporary elevator in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) all work in pits, shaftways and machine rooms necessary for the operation of the elevator, and (4) the replacement of the temporary elevator or parts utilized in connection therewith, if required.

- C. **ACTIVATION TIME** - The Contractor for General Construction Work shall keep the temporary elevator activated from a period of time 15 minutes before the established starting time of that trade which starts work earliest in the morning to 15 minutes after the established quitting time of that trade which stops work latest in the evening. This applies to every day in the week, which is established as a regular working day for the aforementioned trades.
- D. **COMMENCEMENT OF SERVICE** - The Contractor for General Construction Work shall begin to provide temporary elevator service using the selected main passenger elevator no later than eight (8) weeks (40 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed the following work shall have been completed:
1. The shaft shall have been completely enclosed by either the permanent or a temporary enclosure meeting the requirements of the law.
 2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
 3. There shall have been installed on all floors at the shaftway entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks and any necessary approved wire mesh barricades for adjacent shaftways.
 4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.
- E. **ELECTRICAL INSTALLATION** - The Contractor for Electrical Work, not later than 20 calendar days after the machine room roof slab or that portion of its surrounding the elevator has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected such feeders to the terminals on the starter panels or controllers in the machine room to the low voltage transformers and car light outlets in the center of shaftway and for the car control and signal traveling cables. The Contractor for Electrical Work shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer. The cost of this work shall be included in the Contractor for Electrical Work's Contract.
- F. **REMOVAL** - When elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor for General Construction Work shall remove the temporary enclosures and all temporary elevator equipment and promptly proceed with the installation of the permanent equipment as is required under the Contract.
- G. **INSPECTION** - Before temporary elevator equipment has been removed, a joint inspection of the equipment shall be made by the Contractor for General Construction Work and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection deems it necessary, the Contractor for General Construction Work shall furnish and install new governor and compensating ropes, new traveling cables and new controller parts, etc. The car and counterweight safeties shall be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefor will be made in accordance with Article 26 of the Contract.
- H. **REPLACEMENT** - The Contractor for General Construction Work shall replace with new, any of the equipment or parts of the temporary elevator installation that were damaged, destroyed, or that indicate excessive wear or corrosion excepting the replacement of hoisting ropes. All shaftways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly

cleaned. Where lubricated rails are used they shall be washed down. If roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., shall be borne by the Contractor for General Construction Work except for the replacement of hoisting ropes.

- I. **COSTS** - The Contractor for Electrical Work shall pay the costs of all electrical current used for operating the temporary elevators. The Contractor for General Construction Work shall provide all necessary conduit and wiring connections for the proper operation of the elevator and the signaling of the temporary elevators.
- J. **LIMITATIONS OF USE** - The temporary elevator shall not be used during its operation for hoisting of materials or removal of rubbish, but shall be limited only to the transportation of employees of all Contractors and the representatives of City Departments and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the various Contractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation, but only after such times as all plastering has been completed from the second floor up. The particular Contractor using the elevator for the hoisting of its material shall be responsible for any damage to the elevator during the entire period of such use. The Contractor for General Construction Work shall give notification in writing to the Resident Engineer of any alleged damage to the elevator installation within 24 hours after the elevator has been employed for the hoisting of materials by the particular Contractor(s).
- K. **PAYMENT FOR USE** - The Contractor for General Construction Work shall be paid for its operation and maintenance of the temporary elevator or permanent elevator used for temporary service at the daily rate indicated under the Item of its Contract. All other costs in connection with the elevator installation and equipment, excepting electrical work done by the Contractor for Electrical Work under its Contract, shall be included in the Contractor for General Construction Work's Contract.
- L. **LIQUIDATED DAMAGES** - The Contractor for General Construction Work will be charged at the rate of \$100 per day for each day it fails to provide the temporary elevator service described in this section beginning with the 41st working day after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor for General Construction Work.
- M. **OVERTIME USE** - All Contracts. Whenever any Contractor or Contractors work before or after the regular work hours as indicated in Paragraph B above, or on a Saturday, Sunday or Holiday, such Contractor or Contractors shall pay the Contractor for General Construction Work for the operation and maintenance of the temporary elevator, if required by such Contractor or Contractors, at the daily rate indicated in the Contract but increased to reflect the difference between regular wage rates and overtime wage rates. The basic hourly charge shall be considered as one ninth (1/9) of the amount shown in the Item of the Bid form of the General Construction Work Contract. The City will not pay any Contractor for such overtime use of the elevator. When more than one (1) Contractor is involved in the overtime work, the charges shall be prorated as determined by the Resident Engineer unless otherwise agreed mutually among all the Contractors involved.

PART B - FOR NEW BUILDINGS OVER 15 STORIES (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **INSTALLATION** - The Contractor for General Construction Work shall install and complete, as indicated herein, two (2) selected main elevators in the Project for temporary operation by the Contractor for General Construction Work for the transporting of employees of all Contractors and representatives of the Department of Design and Construction and other Governmental Agencies having jurisdiction over work at the project. The Contractor for General Construction Work shall furnish, install and maintain for such elevators, all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices and all other permanent or temporary parts. The installation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use. The two (2) elevators will not be operated simultaneously.

- B. **RESPONSIBILITY** - The Contractor for General Construction shall be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith. The Contractor for General Construction shall employ and pay wages, including overtime wages if necessary, for all workers required for the operation and maintenance of the temporary elevator. The Contractor for General Construction shall be responsible for all costs for: (1) the installation of the temporary elevator, (2) maintaining the temporary elevator in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) all work in pits, shaftways and machine rooms necessary for the operation of the elevator, and (4) the replacement of the temporary elevator or parts utilized in connection therewith, if required.
- C. **ACTIVATION TIME** - The Contractor for General Construction Work shall keep the temporary elevator activated from a period of time 15 minutes before the established starting time of that trade which starts work earliest in the morning to 15 minutes after the established quitting time of that trade which stops work latest in the evening. This applies to every day in the week, which is established as a regular working day for the aforementioned trades.
- D. **LOW RISE ELEVATOR** - The Contractor for General Construction Work shall begin to provide temporary elevator service using one (1) selected main passenger elevator no later than six (6) weeks (30 working days) after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. No later than one (1) week, five (5) working days, after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped the following work shall have been completed:
1. The shaft shall have been completely enclosed up to the 12th Floor by either the permanent or a temporary enclosure meeting the requirements of the law.
 2. A temporary machine room enclosure shall have been provided at the 11th Floor and shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
 3. There shall have been installed on all floors up to and including the 9th Floor at the shaft entrances to the elevator, solid substantial wood frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaftways.
 4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.
- E. **ELECTRICAL INSTALLATION** - The Contractor for Electrical Work, not later than 10 calendar days after the 12th Floor slab or that portion of it surrounding the elevator, has been poured and stripped, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected such feeders to the terminals on the starter panels or controllers in the temporary machine room, to the low voltage transformers and car light outlets in the center of the shaftway and for the car control and signal traveling cables. The Contractor for Electrical Work shall make all these required connections as soon as the Equipment is declared ready for such connections by the Resident Engineer. The cost of this work shall be included in the Contractor for Electrical Work's Contract.
- F. **HIGH RISE ELEVATOR** - The Contractor for General Construction Work shall begin to provide temporary elevator service to all floors, using a selected main passenger elevator, no later than eight (8) weeks (40 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed, the following work shall have been completed:

1. The shaft shall have been completely enclosed by either the permanent or temporary enclosure, meeting the requirements of the law.
2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
3. There shall have been installed on all floors at the shaftway entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaftways.
4. There shall have been furnished and installed, solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.

G. The Contractor for Electrical Work, not later than 20 calendar days after the machine room slab or that portion of it surrounding the elevator shaft has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the high rise elevator to be used for temporary service and shall have connected such feeders to the terminals on the motor-generator starter panels or controllers in the machine room, to the signal circuits low voltage transformers for the annunciators and car light outlets in the center of shaftway.

The Contractor for Electrical Work shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer. The cost of this work shall be included in the Contractor for Electrical Work's Contract.

H. When the high rise elevator is completed and ready for temporary operation, the low rise temporary elevator shall be shut down.

I. When one (1) or more elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor for General Construction Work shall remove the temporary enclosures and all temporary elevator equipment, and promptly proceed with the installation of the permanent equipment as is required under the Contract.

J. Before temporary elevator equipment has been removed, a joint inspection of the equipment shall be made by the Contractor for General Construction Work and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection determines it necessary, the Contractor for General Construction Work shall furnish and install new governor and compensating ropes, new traveling cables, new controller parts, etc. The car and counterweight safeties shall be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefor will be made in accordance with Article 26 of the Contract.

K. The Contractor for General Construction Work shall replace with new, any of the equipment or parts of the temporary elevator installations that were damaged, destroyed, or that indicate excessive wear or corrosion excepting the replacement of hoisting ropes. All shaftways, pits, motor rooms and sheaves spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall be washed down, if roller guides are used, all rust, dirt, etc., must be removed from the rails. The full cost of parts replacement cleaning, etc., shall be borne by the Contractor for General Construction Work except for the replacement of hoisting ropes.

L. The Contractor for Electrical Work shall pay the costs of all electrical current used for operating the temporary elevators. The Contractor for General Construction Work shall provide all necessary conduits and wiring connections for the proper operation of the elevators and the signaling of the temporary elevators.

- M. No temporary elevator shall be used during its operation for hoisting of materials or removal of rubbish, but shall be limited only to the transportation of employees of all Contractors and the representatives of City Departments and other governmental agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specific times to the various Contractors to hoist materials which, in the Resident Engineer's opinion, will not overload or damage the elevator installation, but only after such time as all plastering has been completed from the second floor up. The particular Contractor using the elevator for the hoisting of its material shall be responsible for any damage to the elevator during the entire period of such use. The Contractor for General Construction Work shall give notification in writing to the Resident Engineer of any alleged damage to the elevator installation within 24 hours after the elevator has been employed for the hoisting of materials by the other Contractors.
- N. The Contractor for General Construction Work shall be paid for its operation and maintenance of each temporary elevator or permanent elevator used for temporary service at the daily rate indicated under the item of its Contract. All other costs in connection with elevator installation and equipment, excepting Electrical Work done by the Contractor for Electrical Work under its Contract, shall be included in the Contractor for General Construction Work's Contract.
- O. LIQUIDATED DAMAGES - The Contractor for General Construction Work will be charged at the rate of \$100 per day for each day it fails to provide the temporary elevator service described in this Section beginning with the 31st working day after the 12th Floor slab, or that portion of the 12th Floor slab surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor for General Construction Work.
- P. OVERTIME USE - ALL CONTRACTS. Whenever any Contractor(s) work before or after the regular work hours as indicated in Subparagraph B above, or on a Saturday, Sunday or Holiday, such Contractor or Contractors shall pay the Contractor for General Construction Work for the operation and maintenance of the temporary elevator, if required by such Contractor or Contractors, at the rate indicated in the Item of the bid form of the General Construction Work Contract but increased to reflect the difference between regular wage rates and overtime wage rates. The basic hourly charge shall be considered as one ninth (1/9) of the amount shown in the item of the General Construction Work Contract. The City will not pay any Contractor for such overtime use of the elevator. When more than one (1) Contractor is involved in the overtime work, the charges shall be prorated as determined by the Resident Engineer unless otherwise agreed mutually among all the Contractors involved.

PART C - EXISTING BUILDINGS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. The Contractor for General Construction Work may use, at the Commissioner's discretion, one (1) selected elevator in the project for temporary operation by the General Construction Work Contractor for the transportation of employees of all Contractors and representatives of the Department of Design and Construction and other Governmental Agencies having jurisdiction over work at the Project. The Contractor for General Construction Work shall maintain for such elevators, all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices hand reset target annunciators, signal devices, and all other permanent or temporary parts. The installation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.
- B. The Contractor for General Construction shall be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith. The Contractor for General Construction shall employ and pay wages, including overtime wages if necessary, for all workers required for the operation and maintenance of the temporary elevator. The Contractor for General Construction shall be responsible for all costs for: (1) the installation of the temporary elevator, (2) maintaining the temporary elevator in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) all work in pits, shaftways and machine rooms necessary for the operation of the elevator, and (4) the replacement of

the temporary elevator or parts utilized in connection therewith, if required.

- C. The Contractor for General Construction Work shall keep the temporary elevator activated from a period of time of 15 minutes before the established starting time of that trade which starts work earliest in the morning to 15 minutes after the established quitting time of that trade which stops work latest in the evening. This applies to every day in the week, which is established as a regular working day for the aforementioned trades.
 - D. The Contractor for General Construction Work shall replace with new any of the equipment or parts of the elevator for temporary operation installation that were damaged, destroyed, or that indicate excessive wear or corrosion excepting the replacement of hoisting ropes. All shaftways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall be washed down, if roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., shall be borne by the Contractor for General Construction Work except for the replacement of hoisting ropes.
 - E. The elevator for temporary operations shall be used during its operation for hoisting of materials or removal of rubbish, but shall be limited only to the transportation of employees of all Contractors and the representative of City Departments and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the various Contractors to hoist materials which, in the Resident Engineer's opinion, will not overload or damage the elevator installation. The particular Contractor using the elevator for the hoisting of its material shall be responsible for any damage to the elevator during the entire period of such use. The Contractor for General Construction Work shall give notification in writing to the Resident Engineer of any alleged employed for the hoisting of materials by the particular Contractor(s).
 - F. The Contractor for General Construction Work shall pay all costs for the operation and maintenance of the elevator for temporary operation. All other costs in connection with the elevator and equipment excepting electrical work done by the Contractor for Electrical Work under its Contract, shall be included in the Contractor for General Construction Work's Contract.
 - G. **LIQUIDATED DAMAGES** - The Contractor for General Construction Work will be charged at the rate of \$100 per day for each day it fails to provide elevator services described in this section beginning with 15 consecutive calendar days from notice to proceed. This charge will be deducted from any amount due and owing to the Contractor for General Construction Work.
 - H. **OVERTIME USE - ALL CONTRACTS** - Whenever any Contractor(s) work before or after the regular work hours as indicated in Paragraph B above, or on a Saturday, Sunday or Holiday, such Contractor(s) shall pay the Contractor for General Construction Work for the operation and maintenance of the elevator, if required by such Contractor(s) at the union daily rates but increased to reflect the difference between regular wage rates and overtime wage rates. The City will not pay any Contractor for overtime use of the elevator. When more than one (1) Contractor is involved in the overtime work, the charges shall be prorated as determined by the Resident Engineer unless otherwise agreed mutually among all the Contractors involved.
- 1.36 General Mechanical Requirements (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)**
- A. The General Mechanical Requirements contained herein shall be followed by all Contractors furnishing mechanical equipment under their respective Contracts.
 - B. **CONCEALED PIPING** - and ducts shall mean piping and ducts hidden from sight in masonry or other construction, in floor fill, trenches, partitions, hung ceilings, furred spaces, pipe shafts and in service tunnels not used for passage. Where piping and ducts run in areas that have hung ceilings, such piping and ducts shall be installed in the hung ceilings.
 - C. **THE CONTRACT DRAWINGS** - are in part diagrammatic and show the general arrangement of the equipment, ducts and piping included in the Contract and the approximate size and location of the

equipment. The Contractor shall follow these Contract Drawings in laying out the work and shall consult the Contract Drawings of the other Contracts to become familiar with all conditions affecting it and to verify the spaces in which it will be installed. The Contractor shall cooperate with the Public Utilities doing certain necessary work for this project. The attention of the Contractor is called to the Contract Drawings for General Construction Work for the location, arrangement and extent of plumbing and other fixtures and equipment. All work shall be installed in locations as shown on these Contract Drawings.

- D. **CERTIFICATES** - On completion of the work, the Contractor shall obtain certificates of inspection, approval, acceptance and of compliance with all laws from all agencies and/or entities having jurisdiction over the work and shall deliver these certificates to the Commissioner. The work shall not be deemed substantially complete until the certificates have been delivered.
- E. **SHOP DRAWING SUBMITTALS** - Contractors doing mechanical work shall submit, as directed, Shop Drawings, roughing drawings, manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified.
1. Submit sheet metal shop standards. Submit manufacturer's product data including gauges, materials, types of joints, scaling materials and installations for metal ductwork materials and products.
 2. Submit scaled layout drawing (3/8"=1') of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, slopes of horizontal runs, wall and floor penetrations and connections. Show modifications of indicated requirements made to conform to local shop practice and how those modifications ensure that free area, materials and rigidity are not reduced. Layouts should include all the room plans, mechanical equipment rooms and penthouses. Method of attachment of duct hangers to building construction all with the support details. Coordinate shop drawings with related trades prior to submission.
 3. Indicate duct fittings, particulars such as gauges, sizes, welds and configuration prior to start of work for low-pressure systems.
 4. Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data and shop drawings in maintenance manual.
- F. **ACCESSIBILITY** - All work shall be installed by the Contractor so as to be readily accessible for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they shall not be made without approval by the Commissioner.
- G. **CHANGES IN PIPING, DUCTS, AND EQUIPMENT** - Wherever field conditions are such that for proper execution of the work, reasonable changes in location of piping, ducts and equipment are necessary and required, the Contractor shall make such changes as directed and approved, without extra cost to the City.
- H. **CLEANING OF PIPING, DUCTS, AND EQUIPMENT** - Piping, ducts and equipment shall be thoroughly cleaned by the Contractor of all dirt, cuttings and other foreign substances. Should any pipe, duct or other part of the several systems be obstructed by any foreign matter, the Contractor will be required to pay for disconnecting, cleaning and reconnecting wherever necessary for the purpose of locating and removing obstructions. The Contractor shall pay for repairs to other work damaged in the course of removing obstructions.
- I. **STANDARDIZATION OF SIMILAR EQUIPMENT** - Unless otherwise particularly specified, all equipment of the same kind, type or classification, and used for identical purposes, shall be the product of one (1) manufacturer.
- J. **MACHINERY PARTS** - shall conform exactly to the dimensions shown on the Contract Drawings. The equivalent parts of identical machines shall be identical so that they can be interchangeable.

- K. **FITTINGS** - All grease lubricating fittings on equipment shall be of a uniform type and shall be readily accessible and types proposed to be used shall be submitted for approval.
- L. **GUARDS** - All machinery shall be designed with protecting guards conforming with the requirements of the Industrial Code of the New York State Department of Labor or OSHA, whichever is stricter.
- M. **LIMIT SWITCHES** - Unless otherwise specified, limit switches and other mechanically actuated switches shall be enclosed in tight metal boxes and be installed in the proper locations ready for conduit connections. Switches shall be complete with all supports, stops, cams, arms, tripping and operating members, which shall be adjustable where required for proper functioning.
- N. **ANCHORS, BOLTS, ETC. AND FOUNDATIONS** - Unless otherwise specified, the Contractor shall furnish the necessary anchors, bolts, guides, track rails, bearing plates, substantial templates and all other appurtenances, and build the necessary foundations, as approved by the Commissioner, for all equipment supplied by the Contractor under its Contract.
- O. **EQUIPMENT DESIGN** - Equipment and appurtenances shall be designed in conformity with ASME and AIEE standards and shall be of rugged construction and of sufficient strength to withstand all stresses which may occur during fabrication, testing, transportation, installation, and all conditions of operations. Adequate stays, braces and anchors shall be provided. All bearings and moving parts shall be adequately protected against wear by bushings, or other approved means, and shall be fully lubricated by readily accessible devices. Details shall be designed for appearance as well as utility. Protruding members, joints, corners, gear covers and the like shall be finished in appearance. All exposed welds shall be ground smooth and the corners of structural shapes shall be mitered.
- P. **SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR** - Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor shall be designed and built by the Contractor of sufficient strength to safely withstand all stresses to which they may be subjected, within permissible deflections, and shall meet the following standards:
1. Structural Steel - ASTM Standard Specifications, AISC and NYBC.
 2. Concrete for supports for equipment shall conform to the Specifications for concrete herein, but in no case shall be less than the requirements of the NYBC for average concrete.
 3. Steel reinforcement for concrete shall be of intermediate grade and shall meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.
- Q. **ENGINEER'S ASSUMED DESIGN DATA** - All structural steel, concrete and reinforcement indicated or specified to support the equipment or appurtenances and the area immediately adjacent thereto have been designed from data based on assumed average anticipated clearances and loading. The final structural design in these locations will be based on definite data received from the Contractor after the Commissioner approves the equipment and appurtenances to be installed. The Commissioner will then redesign, if necessary, the supporting structure to properly support and maintain the approved equipment and appurtenances. Necessary major changes in design will be covered by Supplementary Drawings that will be furnished to the Contractor. All changes indicated or necessary to accommodate the equipment and appurtenances, shall be incorporated into the Working Drawings submitted for approval, and the cost of furnishing and installing the work necessitated by these changes shall be borne by the Contractor furnishing the equipment.
- R. **INSTALLATION OF EQUIPMENT** - Equipment shall be erected in a neat and workmanlike manner on the foundations, at the locations and elevations shown on the Contract Drawings or as required. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between various units and with piping and equipment that may be installed under other Contracts. When required by the Specifications, the Contractor shall obtain the assistance of a competent and experienced Engineer or Superintendent, in the employ of the manufacturer, to install the equipment.

- S. **ELIMINATION OF NOISE** - All work provided under the Contract shall operate without objectionable noise or vibration.
1. Should operation of any one or more of the several systems produce noise or vibration which is, in the opinion of the Commissioner, objectionable, the Contractor shall at its own expense make changes in piping, equipment, etc. and do all work necessary to eliminate objectionable noise or vibration.
 2. Should noise or vibration found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from equipment installed under the Contract, the Contractor shall at its own expense install such insulators and make such changes in or additions to the installations as may be necessary to prevent transmission of this noise or vibration.
- T. **GROUTING** - The Contractor shall furnish all material and labor for proper bedding on Portland Cement grout, the equipment or its supporting base. Grout shall consist of one (1) part Portland Cement and one (1) part of approved sand. The top of the masonry foundation shall be properly cleaned and wetted before grouting. Grout shall completely fill all spaces between the equipment, or base, and the foundation and it shall generally average one (1) inch in thickness. Leveling wedges shall not be removed before the grout has reached its final set. Voids left by wedges shall be pointed with grout. Exposed surfaces of the grout shall have a finished appearance.
- U. **PRELIMINARY FIELD TEST** - As soon as conditions permit, the Contractor shall furnish all necessary labor and materials for, and shall make, preliminary field tests of the equipment to ascertain compliance with the requirements of the Contract. If the preliminary field tests disclose equipment that does not comply with the Contract, the Contractor shall, prior to the acceptance test, make all changes, adjustments and replacements required.
- V. **INSTRUCTIONS ON OPERATION** - At the time the equipment is placed in permanent operation by the City, the Contractor shall make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor shall instruct the City's operating personnel on the proper maintenance and operation of the equipment for the period of time called for in the Specifications.

1.37 General Electrical Requirements

SCOPE - This Article sets forth the general requirements applicable to electrical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Article and the requirements of the Specifications and/or the Contract Drawings, whichever requirements is the most stringent, as determined by the Commissioner, shall take precedence.

PART A - PROCEDURE--ELECTRICAL APPROVALS

SCOPE- This Section sets forth general electrical information, as well as required approvals for all electrical work required for the Project, including ancillary electrical work which may be included in contracts for other than the Contract for Electrical Work.

- A. **ELECTRIC SERVICE** - The electric service supply is subject to commercial and operating variation of the utility company. Proper provision shall be made to have all apparatus operate normally under these conditions.
- B. **SUPERVISION AND ACCEPTANCE** - The electrical work and equipment shall be installed under the supervision of the Commissioner's representative. Final acceptance and approval of the work will be contingent upon the inspection and test of the installation by the City regulatory agency, on completion.
- C. **TESTS** - The Contractor shall notify the Commissioner when the Contractor will examine and begin

work and shall also notify the Commissioner when the Contractor has completed the work and is ready to have it inspected and tested. Upon completion of the work and prior to final payment, tests shall be made as required by the Commissioner of all electrical materials, electrical and associated mechanical equipment, and of appliances installed hereunder. The Contractor shall furnish all labor and material for such tests. Should the tests show that any of the material, appliances or workmanship are not first class or not in compliance with the Contract, the Contractor on written notice shall remove and promptly replace them with other materials in conformity with the Contract.

- D. **CERTIFICATE OF THE BUREAU OF ELECTRICAL CONTROL, OF THE DEPARTMENT OF BUILDINGS (B.E.C.)** - Before final payment is made, there must be filed with the Department of Design and Construction, a Certificate of Inspection signed by the Director of the B.E.C., which Certificate shall certify that all materials and workmanship comply with the rules and regulations of the B.E.C. of the City of New York and with the Electrical Code of the Administrative Code of the City of New York.
- E. **RESPONSIBILITY FOR CARE AND PROTECTION OF EQUIPMENT**
1. The Contractor furnishing any equipment shall be responsible for the equipment until it has been finally inspected, tested and accepted, in accordance with the requirements of these Specifications.
 2. After delivery and before and after installation, the Contractor shall protect all equipment against theft, injury or damage from all causes. The Contractor shall carefully store all equipment received for work, which is not immediately installed. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through a special dielectric test as directed by the Commissioner, at the expense of the Contractor or replaced by the Contractor without additional cost to the City.
- F. **UNIFORMITY OF EQUIPMENT** - Any two (2) or more pieces of apparatus or materials of the same kind, type or classification and being used for identical types of service, shall be made by the same manufacturer.
- G. **CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL**
1. The Contractor shall submit to the Commissioner for approval, complete dimensional drawings of all equipment, wiring diagrams, motor test data, details of control, installation layouts showing all details and locations and including all schedules, and descriptions and supplementary data to comprise complete working drawings and instructions for the performance of the work. A description of the operation of the equipment and controls shall be included. A letter, in triplicate, shall accompany each submittal.
 2. The Contractor shall submit duplicate samples of such materials and appliances as may be requested by the Commissioner for approval. These samples shall be properly tagged for identification and submitted for examination and test. After the samples are approved, one (1) sample will be returned to the Contractor and the other sample will be filed in the office of the Commissioner's representative for inspection use. After the Contract is completed, the second set of samples will be returned to the Contractor.
- H. **TIMELINESS** - All material shall be submitted in sufficient time for the program of construction. Failure to promptly submit acceptable samples and dimensional drawings of equipment will not be accepted as grounds for an extension of time. The Commissioner may decline to consider submittals unless all related items are submitted at the same time.
- I. **CONTRACTOR'S STATEMENT WITH SUBMITTALS** - All dimensional drawings of equipment, blueprints, catalogues, models, samples and other data relative to the equipment, the materials, the work or any part thereof submitted for approval are to be accompanied by a statement that they have been examined by the Contractor and that the drawings, data and other material submitted agree with the requirements of the Contract and Specifications and shall list and describe the points of

disagreements, if any exist. In the absence of such statement, approvals will be given with the understanding that articles of equipment or materials or methods of installation are in substantial compliance with the Contract and that if the adoption of these designs, details, articles, equipment, materials, constructions, installations, places and locations necessitate changes, alterations or replacements at an increased cost to the Contractor or others, the Contractor making the substitution for the specified equipment or material shall bear all such additional expense involved.

- J. **BULLETINS AND INSTRUCTIONS** - The Contractor shall furnish and deliver to the Commissioner, after acceptance of the work, four (4) complete sets of instructions, technical bulletins and any other printed matter (diagrams, prints, or drawings) required to provide complete information for the proper operation, maintenance and repair of the equipment and the ordering of spare parts.

PART B - TEMPORARY LIGHTING, SITE SECURITY LIGHTING & POWER

SCOPE - This Section sets forth the General Conditions and procedures relating to Temporary Lighting, Site Security Lighting and Power during the construction period, and is applicable to, and binding on, all Contracts insofar as they are affected.

A. TEMPORARY LIGHTING (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. Energy for the Temporary Lighting System for minor rehabilitation projects (those projects whose existing distribution system is not being changed or modified under the scope of this project) may be taken from the existing electrical distribution system if the existing system is of adequate capacity for the additional temporary lighting load. The Contractor for Electrical Work is to cooperate and coordinate with the facility custodian so as not to interfere with the normal operation of the facility.
2. Energy for the Temporary Lighting system for new projects and for those existing projects that are not covered in the preceding paragraph shall be provided as in the following paragraphs.
3. **CONNECTION TO UTILITY LINES** - Temporary Electric Service for use during construction shall be provided as follows: The Contractor for Electrical Work shall provide adequate service for the temporary lighting system, or a minimum of 100 Amperes, 3-phase, 4-wire service for the temporary lighting system, whichever is greater, and make all necessary arrangements with the Public Utility Company and pay all charges by them for the Temporary Lighting system. The Contractor for Electrical Work shall include in its bid any charges which may be made by the Public Utility Company for extending its electrical facilities, and for making final connections. The Contractor for Electrical Work shall make payment directly to the Public Utility Company.
4. **APPLICATIONS FOR METER** - The Contractor for Electrical Work shall make application to the Public Utility Company and sign all documents necessary for, and pay all charges incidental to, the installation of a watt hour meter or meters for Temporary Lighting. The Contractor for Electrical Work shall pay to the Public Utility Company, all bills for Temporary Lighting energy used throughout the work, as they become due.
5. **SERVICE AND METERING EQUIPMENT** - The Contractor for Electrical Work shall furnish and install, at a suitable location on the site, approved service and metering equipment for the Temporary Lighting System, ready for the installation of the Public Utility Company's metering devices. The temporary service mains to and from the metering location shall be not less than 100 Amperes, 3-phase, 4-wire and shall be of sufficient capacity to take care of all demands for Temporary Lighting and Site Security Lighting and shall meet all requirements of the NYCEC.
6. The Contractor for Electrical Work shall furnish and connect to the metered service point, a system of Temporary Lighting to illuminate the entire area where work is being performed and points adjacent to the work, with separately fused circuits for stairways and bridges. Control switches for stairway circuits shall be located near entrance on ground floor.

7. ITEMS - The Temporary Lighting System shall consist of wiring, fixtures, left-hand double sockets, (one (1) double socket for every 400 square feet, with one (1) lamp and one (1) three-prong outlet) lamps, fuses, locked type guards, trailers and any other incidental material. Additional details may be outlined in the detailed Specifications for the Electrical Work. Changes may be made, provided the full equivalent of those requirements is maintained.
8. The Temporary Lighting System shall be progressively installed as required for the advancement of the work under the various Contracts.
9. RELOCATION - Any Contractor requiring the relocation or extension of the original Temporary Lighting System that is not required due to the normal advancement of the work, as determined by the Commissioner's field representative, shall bear all costs thereof.
10. TRAILERS - Trailers shall be furnished with left-hand sockets with locked type guards and 40 feet of rubber covered cable. The Contractor for Electrical Work shall furnish and distribute a minimum of three (3) complete trailers to each Contractor. See the detailed Electrical Specifications for possible additional trailers required.
11. LAMPS - The Contractor for Electrical Work shall furnish and install one (1) complete set of lamps, including those for the trailers. Broken and burned out lamps in the general lighting system shall be replaced by the Contractor for Electrical Work while those in the trailers shall be replaced by the Contractor using such equipment. All lamps shall be 100 watt.
12. CIRCUIT PROTECTION - The Contractor for Electrical Work shall furnish and install GFI protection for the Temporary Lighting and Site Security Systems.
13. ENERGIZING - The Contractor for Electrical Work shall keep the Temporary Lighting System energized from a period of time, 15 minutes before the established starting time of that trade, which starts work earliest in the morning to 15 minutes after the established quitting time of that trade which stops work latest in the evening. This applies to every day in the week which is established as a regular working day for any trade involved in the construction of this facility and holds until completion and final acceptance of the work of the Contractor for Electrical Work or until the services are terminated by instructions from the Commissioner.
14. MAINTENANCE OF TEMPORARY LIGHTS
 - a. The Contractor for Electrical Work shall maintain the Temporary Lighting System in good working order during the scheduled hours established.
 - b. The Contractor for Electrical Work is to include in its contract all charges for energy for the Temporary Lighting System.
 - c. The Contractor is advised to show the estimated cost of the installation, maintenance and energy of temporary electrical facilities in its detailed cost estimate of its Contract so as to facilitate partial payments during construction.
15. OVERTIME USE - Any Contractor requiring Temporary Lighting Service before or after hours set forth hereinbefore, or on weekends or a Holiday for all trades involved in the construction of this facility, shall pay for the additional cost of keeping the system energized and repaired. If more than one (1) Contractor is involved, the charges shall be prorated, or shared by other acceptable means previously agreed upon by the Contractors involved. When overtime is required by all Contractors on the work, the provisions for payment for regular time use of the Temporary Lighting System shall apply.
16. SERVICE BEYOND COMPLETION DATE - When failure to comply with the terms and conditions of any Contract necessitates temporary light beyond the date set for completion of the Contract for Electrical Work, the Contractor requiring such additional service shall pay for keeping it energized. When more than one (1) Contractor requires such service, the expense thereof shall be prorated

as determined by the Commissioner.

17. **ADJUSTMENT IN CONTRACT PRICE FOR TEMPORARY LIGHTING MAINTENANCE** - In the event that the temporary lighting maintenance extends beyond the Contract time through no fault of the Contractor for Electrical Work, the additional maintenance cost will be in accordance with the requirements of the following paragraphs:

- a. Payment for maintaining Temporary facilities when required will be made at the average hourly wage for electricians plus 69% of this rate, for each hour of work done upon order of the Resident Engineer. Payments will be included in partial estimates upon submission of detailed vouchers stating date, hour and time expended for each item of work.
- b. The addition of 69% of the average hourly wage rate specified above shall be deemed as the total allowance for all profit and overhead and for any and all other costs and expenses of any nature whatsoever, including but not limited to allowance for insurance, workman's compensation, unemployment insurance and other supplementary benefits.

18. **REMOVAL OF TEMPORARY LIGHTING WIRING** - The temporary lighting system shall be removed by the Contractor for Electrical Work when authorized by the Commissioner.

19. **HAND TOOLS** - The temporary electric lighting system shall not be used for power purposes, excepting that light hand tools not larger than 1/4 horsepower may be operated therefrom by any Contractor.

B. SITE SECURITY LIGHTING (FOR NEW CONSTRUCTION ONLY) (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. The Contractor for the Electric Work shall furnish, install and maintain a system of site security lighting, as herein specified, to illuminate the construction site of the project, and it shall be connected to and energized from the Temporary Lighting System.
2. It is essential that the site security lighting system be completely installed and operating, at the earliest possible date. All Contractors must cooperate, coordinate and exert every effort to accomplish an early complete installation of the site security lighting system. After the system is installed and in operation, and a part of the system interferes with the work of any trade, that trade shall be completely responsible for the expense of removing, relocating and replacing all equipment necessary to reinstate the system to proper operating conditions.
3. The system shall consist of flood lighting by pole mounted guarded sealed-beam units. Floodlight units shall be mounted 16 feet above grade. Floodlights shall be spaced around the perimeter of the site to produce an illumination level of no less than one (1) foot candle around the perimeter of the site, as well as in any potentially hazardous area or any other area within the site that might be deemed by the Resident Engineer to require security illumination. The system shall be installed in a manner acceptable to the Resident Engineer. The first lighting unit in each circuit shall be provided with a photoelectric cell for automatic control. The photoelectric cell shall be installed as per manufacturer's recommendations.
4. All necessary poles shall be furnished and installed by the Contractor for Electrical Work.
5. The site security system shall be kept illuminated at all times during the hours of darkness. The Contractor for Electrical Work, at its own expense, shall keep the system in operation, furnishing and installing all material necessary to replace all damaged or burned out parts.
6. The Contractor for Electrical Work shall be on telephone call alert for maintaining the system during the operating period stated above.
7. All materials and equipment furnished under this section shall remain the property of the Contractor for Electrical Work and shall be removed and disposed of by the Contractor for

Electrical Work upon completion of that phase of the project.

C. TEMPORARY POWER

1. Any Contractor requiring temporary power for equipment larger than 1/4 horsepower shall arrange with the Public Utility for service and pay for all electrical energy consumed by its lines.
2. The Contractor shall provide service, metering equipment and distribution centers as required, and be responsible for keeping the system in working order.
3. When directed by the Commissioner, the Contractor shall remove its own temporary power system.

D. USE OF COMPLETED PORTIONS OF THE ELECTRICAL WORK

1. **USE OF MAIN DISTRIBUTION PANEL** - As soon as the permanent electric service feeders and equipment, metering equipment and main distribution panel are installed and ready for operation, the Contractor for Electrical Work shall have the temporary lighting system changed over from the temporary service points to the main distribution panel.
2. **COST OF CHANGE OVER** - The Contractor for Electrical Work shall be responsible for all cost due to this change over of service and it shall also make application to the Public Utility Company for a watt hour meter to be set on the permanent meter equipment.
3. The requirements for temporary lighting specified herein shall be adhered to after change over of service.
4. **NO EXTRA COST** - The operation of the service and switchboard equipment shall be under the supervision of the Contractor for Electrical Work, but this shall in no way be interpreted to mean the acceptance of such part of the installation or relieve the Contractor from its responsibility for the complete work or any part thereof. There shall be no additional charge for supervision by the Contractor for Electrical Work.

PART C - ELECTRICAL INSTALLATION PROCEDURE

SCOPE - This Section sets forth the general installation procedure that shall apply to all electrical work and electrical equipment appearing in any of the Contracts.

- A. INTENT OF CONTRACT DOCUMENTS** - Contract Specifications and Contract Drawings are to be interpreted as a means of conveying the scope and intent of the work without giving every minor electrical detail. It is intended, nevertheless, that each Contractor shall provide whatever labor and materials are found necessary, within the scope of its Contract, for the successful operation of the installation. Specific details of individual installations are to be finally decided upon when the Contractor submits Working or Shop Drawings for approval to the Department of Design and Construction. Whenever there are two (2) or more methods to complete project work within the Contract scope, the Commissioner reserves the right to choose that method which, in the Commissioner's opinion, will afford the most satisfactory performance, lasting qualities, and accessibility for repairs, even though this selection is the most costly.
- B. SCHEMATIC PLANS - APPROXIMATE LOCATIONS** - Conduits and wiring are shown on the plans for diagrammatic purposes only. Therefore, conduit layouts may not necessarily give the actual physical route of the conduits. The Contractor who installs a conduit system will also be required, as part of the work, to furnish and install all hangers and pull-boxes, including any special pull-boxes found necessary to overcome interferences, and to facilitate the pulling of electrical cables. Similarly, the locations of equipment, appliances, outlets and other items shown on Contract Drawings are only approximate and are to be definitively established when equipment Shop Drawings are submitted and approved by the Department of Design and Construction during construction.

- C. **SLEEVES** - required for conduits passing through walls or floors, shall be furnished and set by the Contractor installing the conduits. Sleeves in waterproofed floors shall be provided with flashing extending 12 inches in all directions from sleeve and secured to waterproofing. Flashing shall be turned down into space between pipe and sleeve and caulked watertight. Flashing shall be 20 oz. cold rolled copper. Sleeves shall be supplied with welded flanges similar to those supplied by the Contractor for Plumbing Work and shall extend one (1) inch above finished floor.
- D. **COORDINATION** - Each Contractor shall keep in close touch with the construction progress and obtain the necessary information for the accurate placement of its work in ample time before project construction operations obstruct its work. Each Contractor is to consult all other Contract Drawings, as well as approved equipment Shop Drawings on file in the Resident Engineer's Field Office. This will aid in avoiding interferences, omissions and errors in the electrical installation.
- E. **RESPONSIBILITY FOR ERRORS OF INSTALLATION** - In case of interference with the work of others or erroneous placement of work with respect to equipment or structures, each Contractor shall cooperate with other affected Contractors for an immediate agreeable solution of the affected work with each Contractor furnishing its responsible share of the labor and materials necessary to complete the installation in an approved manner.
- F. **RESTORATION** - If drilling or cutting is done on finished surfaces of equipment or the structure, any marring of the surface shall be repaired or replaced by the Contractor who caused the damage. Each Contractor shall be held responsible for corrective restoration due to its cutting or drilling, and for any damage to the project or its contents caused by the Contractor or the Contractor's workers. Any Contractor who pierces waterproofing because of the installation of their work shall, at their own expense, restore the waterproofing to the satisfaction of the Commissioner.
- G. **ELECTRICAL WORK AT SITE** - Any Contractor who is required to furnish equipment consisting of a number of related electrical devices or appliances, mounted in a single enclosure, or on a common base, shall furnish this unit complete with internal wiring, connections, terminal boxes with copper connectors and/or lugs and ample electrical leads, ready for connection and operation. The cost of any wiring, re-wiring or other work required to be done on this unit in the field, shall be borne by the Contractor who furnished the unit, without cost to the City.
- H. **COOPERATION AMONG CONTRACTORS** - Whenever an electrically operated unit or system involves the combined work of several Contractors for its installation and successful operation, each Contractor shall exercise the utmost diligence in cooperating with others to produce a complete, harmonious installation.
- I. **DEFINITIONS**
1. **WIRING** means both wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).
 2. **POWER WIRING** means wiring from a panelboard or other specified source to a starter (if required) then to a disconnect (if required) then to the final point of usage such as a motor, unit or device.
 3. **CONTROL and/or INTERLOCK WIRING** means that wiring that signals the device to operate or shut down in response to a signal from a remote control device such as a temperature, smoke, pressure, float, etc. device (starters and disconnect switches are not included in this definition) regardless of the voltage required for the controlling device.
- J. **WORK BY CONTRACTORS FURNISHING ELECTRICAL EQUIPMENT** - Any Contractor who furnishes an electrically operated or motorized unit of equipment shall install same and, as part of its Contract, perform the following work in connection therewith:
1. **FOUNDATIONS** - Unless otherwise specified or indicated, the Contractor furnishing electrically operated equipment shall also furnish and install approved foundations for same. Special

foundations, if required, will be described in the detailed Specification.

- a. **MATERIAL** - All foundations, unless required otherwise, shall rest on a structural slab and shall be of poured concrete, of a mixture specified for reinforced concrete. Foundations shall present a neat, smooth appearance without voids, sharp corners or edges.
 - b. **DIMENSIONS** - Foundation dimensions, height above floor, methods of setting, aligning and anchoring of equipment shall be as recommended by the manufacturer of equipment and approved by the Commissioner. The minimum height of foundations above finished floor shall be four (4) inches and foundations shall extend at least six (6) inches at all sides beyond the base plates of equipment.
2. At least one (1) inch of grout shall be applied under the equipment base plate after placement and alignment of the equipment.
 3. **ITEMS** - Anchor plates, bolts, sleeves, nuts and washers and other necessary items for proper installation of equipment shall be provided. The Contractor shall also furnish and set required templates to locate accurately the positions of the hold-down bolts.
 4. **VIBRATION ISOLATION** - If specifically required in the detailed Specifications for a particular unit, vibration isolators shall be provided for rotating equipment.
 5. **SUPPORTS** - If any motorized equipment is required to be mounted overhead or off a wall, the Contractor supplying the unit shall furnish and install a suitable platform, bracket or shelf, whichever is appropriate or specified, and mount the equipment thereon. This support shall be constructed of substantial steel members, plates, etc., and the whole securely fastened to the structure or to anchors previously embedded in the wall or slab. In case of excessive vibration transmitted to structure, isolating pads or other devices shall be installed. The Contractor shall apply one (1) coat of approved primer paint to the support and one (1) additional coat of approved paint in the field.
 6. **ASSOCIATED EQUIPMENT** - The Contractor who furnishes a motorized or electrically operated unit of equipment shall also furnish all associated motor starters, disconnect means, relays, control devices, lamps, or other devices, necessary for the successful functioning of the unit.
 7. **POINT OF DELIVERY** - Any item specified to be installed by the Contractor for Electrical Work and delivered to the site that can not be hand carried (due to bulk, weight or timeliness) to the location of its installation is to be delivered and set in place, leveled and secured by the Contractor furnishing the equipment. Such delivery shall be to the location where it is to be installed by the Contractor for Electrical Work.
 8. **CONTROL AND INTERLOCK WIRING**
 - a. **General Construction Work and Plumbing Work.**
 - (1) All control wiring associated with doors and door hardware is to be furnished and installed, unless otherwise indicated, by the Contractor furnishing the doors. Power for the door operation and for its controls shall be furnished and installed by the Contractor for Electrical Work.
 - (2) All other control wiring associated with equipment furnished by either the Contractor for General Construction Work or the Contractor for Plumbing Work is to be furnished and installed by the Contractor for Electrical Work.
 - b. **Contractor for Heating, Ventilating and Air Conditioning Work**
 - (1) The furnishing and installing of all control devices and all control and interlock wiring for equipment furnished under the Heating, Ventilating and Air Conditioning Contract shall be

by that Contractor, including any power required for any control device.

- (2) The Contractor for Heating, Ventilating and Air Conditioning Work shall deliver to the Contractor for Electrical Work all starters and disconnect switches specified to be furnished under the Heating, Ventilating and Air Conditioning Contract. The Contractor for Electrical Work is to install the starters and disconnect switches, and furnish and install all power wiring and make connections between the starter, disconnect switch and motor or equipment being served. The motor or equipment is to be mounted by the Contractor furnishing the motor.

9. **INSTALLATION OF BURNER** - The Contractor who furnishes and installs the gas/oil-fired boiler/furnace shall also include as part of its Contract, the work of furnishing, installing and connecting all equipment, controls with necessary conduits and wiring, to a service point provided by the Contractor for Electrical Work. Unless detailed otherwise in the Specific Requirements, the Contractor for Electrical Work shall furnish power from the power source to a junction box furnished and installed by the Contractor for the Electrical Work and located near the boiler/furnace control panel. The Contractor for Electrical Work shall also furnish and install an empty conduit and a junction box to be located at a remote location (outside of the boiler/furnace room) for an emergency shut-off switch. The shut-off switch and all other conduit and wire shall be furnished and installed by the Contractor furnishing the boiler/furnace.

K. WORK BY CONTRACTOR FOR ELECTRICAL WORK - The Contractor for Electrical Work shall perform the following work:

1. **PANELETTE** - The Contractor for Electrical Work shall furnish and install a four (4) circuit panelette in each mechanical equipment room.
2. **STARTERS AND DISCONNECT SWITCHES** - The associated disconnect switches and starters approved by the Department of Design and Construction which require mounting or wiring apart from a main equipment unit shall be delivered, prewired, to the Contractor for Electrical Work at the site of the project, who shall install and wire them. The electrical Contractor shall acknowledge acceptance in writing to the Contractor supplying them, and thereafter assume responsibility for their safe keeping until final acceptance of its work by the City.
3. **CONTROL DEVICES** - The Contractor for Electrical Work shall install conduit, wire, and make all connections for all interlock and control devices furnished under the Plumbing Work Contract and also all control and interlock devices furnished under the General Construction Work Contract, except for door control wiring. The various control and interlock devices, furnished (prewired) by the Contractors for Plumbing and General Construction Work Contractors, shall be installed and final connections made by the Contractor for Electrical Work.
4. **DOOR CONTROL WIRING** - Unless specifically detailed otherwise in the Contract Documents for Electrical Work, all door control and interlock devices are to be furnished and installed and wired by the Contractor furnishing the required control and interlock devices.
5. **TESTS** - The Contractor supplying the equipment, together with the Contractor for Electrical Work shall cooperate in making preliminary tests to establish the correctness of the installation. If a faulty operation of the unit is discovered, the Contractor whose work is the cause shall, without delay, remedy the trouble.

L. PAINTING

1. Ingredients and methods of application shall conform to that as required for similar work under the Contract for General Construction Work.
2. **ALL METAL CABINETS** - including switchboards, panelboards, boxes (pull, junction and outlet), trims, doors and covers shall be painted as follows:

All surfaces inside and outside, one (1) approved coat of primer. All accessible surfaces one (1) coat of approved paint inside and outside, in the field after installation.

3. **HANGERS, CONDUITS AND FITTINGS** - The Contractor who installs them shall give one (1) field applied, approved coat primer, followed by a second coat.
4. **FINAL COAT**--A final or third coat of paint, as directed, shall be applied by the Contractor installing them when the wall surfaces on which they are supported or the ceiling from which they are hung are not painted by the Contractor for General Construction Work. Pull boxes shall be neatly and legibly stenciled to show service.
5. **PAINTING OF MOTORIZED EQUIPMENT** - The Contractor furnishing electrically driven equipment shall paint motors and driven equipment, starters and controllers and other equipment provided by the Contractor. The Contractor shall provide any painting or finishing that may be required in the Specifications. For certain equipment having special corrosion resistant factory finishes, painting may be waived by special permission. Equipment shall be neatly stenciled, with legible characters to indicate service by the Contractor who supplies the equipment.
6. **NAME PLATES** - shall be left clean of all paint.

PART D - ELECTRICAL CONDUIT SYSTEM INCLUDING BOXES (PULL, JUNCTION AND OUTLET) - (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

SCOPE - This Section sets forth the requirements applying to any Contract requiring the installation of electrical conduits, boxes or fittings. Rigid steel conduit shall be used through out, unless specifically indicated otherwise. **TYPES**-where the word 'conduit', without a modifier such as, rigid steel, EMT, etc., is specified to be used, it shall be interpreted to mean, rigid steel, heavy wall, threaded conduit.

A. CONDUIT TYPES

1. **RIGID STEEL CONDUIT** - shall be interpreted to mean rigid steel, heavy wall conduit that is hot dipped galvanized inside and outside. The conduit shall meet the requirements of the latest edition, as amended, of the "Standard for Rigid Steel Conduit" of the Underwriters' Laboratories, Inc. Unless otherwise specified in the Specifications or indicated on the Contract Drawings, rigid steel conduit shall be used for all exposed work, for all underground conduits in contact with earth and for fire alarm systems as required by the Building Code. Rigid steel conduit shall be used for all underground conduits in contact with earth, for Fire Alarm Systems and as required by authorities having jurisdiction.
2. **ELECTRICAL METALLIC TUBING (EMT)** - shall be industry standard thin wall conduit of galvanized steel only. All elbows, bends, couplings and similar fittings which constitute a part of the conduit system shall be specifically designed for use with electric metallic tubing. Couplings and terminating fittings shall be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT shall meet the requirements of the latest edition, as amended, of the "Standard for Electrical Metallic Tubing of the Underwriters Laboratories Inc." EMT may only be used where specifically indicated. In no case will EMT be permitted in spaces other than hung ceilings and dry wall partitions.
3. **FLEXIBLE METALLIC** - For final connections to motors and motorized equipment, not more than a 4' - 0" length of flexible conduit may be used; for watertight installations, this conduit shall be of a watertight type, attached with watertight glands or fittings, for final connections from outlet box to recessed lighting fixtures and in locations only where specifically permitted by the Specifications or Contract Drawings.

B. INSTALLATIONS AND APPLICATIONS

1. Unless otherwise specified or indicated on the Contract Drawings, conduit runs shall be installed

concealed in finished spaces.

2. **CONDUIT SIZES** - The sizes of conduit shall be as indicated on the Contract Drawings. Wherever conduit sizes are not indicated, the conduit shall meet the requirements of the NYCEC to accommodate the conductors to be installed therein.
3. Conduits shall be reamed smooth after cutting. No running threads will be permitted. Universal type couplings shall be used where required. Conduit joints shall be screwed up to butt. Empty conduits after installation shall have all open ends temporarily plugged to prevent the entrance of water or other foreign matter.
4. Conduits being installed in concrete or masonry shall be securely held in place by the Contractor installing them during pouring and construction operations. A group of conduits terminating together shall be held in place by a template.
5. **UNDERGROUND STEEL CONDUITS** - Unless otherwise specified, all underground steel conduits in contact with earth shall be encased by the Contractor who installs them, in a covering of not less than two (2) inches of an approved concrete mixture. Concrete mix shall be one (1) part cement to four and one-half (4 ½) parts of fine and coarse aggregate.
6. **EXCAVATION RESTORATION PERMITS** - The Contractor installing underground conduits, duct banks or manholes shall perform, as part of its Contract, the work of cutting pavement, excavation shoring, keeping trenches or holes pumped dry, backfilling, restoration of surfaces to original condition and removal of excess earth and rubbish from premises. During the work, the Contractor shall provide adequate crossovers, protective barriers, lamps, flags, etc., to safeguard traffic and the public. When the work is in a public highway or street, the Contractor shall secure and pay for all necessary permits and inspection fees and pay the cost of repaving.
7. **EXPOSED CONDUIT SUPPORTS** - Exposed conduit shall be supported by zinc coated hangers with necessary inserts, beam clamps of approved design or attached to walls or ceilings by expansion bolts. Exposed conduits shall be supported or fastened at intervals not more than five (5) feet.
8. Exposed conduit shall be installed parallel or at right angles to ceiling, walls and partitions. Where direction changes of exposed conduit cannot be made with neat bends, such as required around beams or columns, conduit type fitting shall be used.
9. The conduit shall be installed with an approved expansion joint:
 - a. Wherever the conduit crosses a building expansion joint (each Contractor will be held responsible for determining where the building expansion joints are located).
 - b. Every 200 feet, when in straight runs of 200 feet or longer.
10. Conduit may only enter and leave a floating slab in the vertical direction, and then only in an approved manner. Horizontal entries into floating slabs are not permitted.
11. Conduit installed in pipe shafts shall be properly supported to carry the total weight of the raceway system complete with cable. In addition at least one (1) horizontal brace per 10 ft. section shall be provided to assure stability of the raceway system.
12. **BUSHINGS AND LOCKNUTS** - Approved bushings and locknuts shall be used wherever conduits enter outlet boxes, switch boxes, pull boxes, panel board cabinets, etc. For conduits one (1) inch in diameter or larger, insulating bushings to be O.Z. or approved equal.
13. **CONDUIT BENDS** - shall be made without kinking conduit or appreciably reducing the internal diameter. All bends in conduit of two (2) inch in diameter or larger shall be made with an hydraulic or power pipe bender. The radius of the inner edge of any bend shall not be less than six (6)

times the internal diameter of the conduit where rubber covered conductors are to be installed. And not less than 10 times the internal diameter of the conduit where lead covered conductors are to be used. Long gradual sweeps will be required, rather than sharp bends, when changes of direction are necessary.

14. EMPTY CONDUITS

- a. **TESTS** - All conduits and ducts required to be installed and left empty shall be tested for clear bore and correct installation by the Contractor who installed them using a ball mandrel and a brush and snake before the installation will be accepted. The ball shall be of lignum vitae turned to approximately 85% of the internal diameter of the raceway to be tested. Two (2) short wire brushes shall be included in the mandrel assembly. Snaking of conduits, ducts, etc., shall be performed by the Contractor in the presence of the Electrical Inspector. Any conduits or ducts which reject the mandrel shall be cleared at once with the Contractor bearing all costs, such as chopping concrete, to replace the defective conduit and restore the surface to its original condition.
- b. **TAGS** - Numbers or letters shall be assigned to the various conduit runs, and as they test clear they shall be identified by a fiber tag not less than 1-1/4 inch width, attached by means of a nylon cord. All conduit terminations in panel, splice or pull boxes as well as those out of the floor or ceiling shall be tagged.
- c. **TEST RECORDS** - As the conduit runs clear, a record shall be kept under the heading of "Empty Conduit Tested, Left Clear, Tagged and Capped" showing conduit designation, diameter, location, date tested and by whom. When complete, this record shall be signed by the Electrical Inspector and submitted in triplicate for approval. This record shall be entered on the Record drawings, which are required under "General Conditions Governing All Contracts."
- d. **CAPPING** - All empty conduit and duct openings, after test, shall be capped or plugged by the Contractor as directed.
- e. **DRAG LINES** - A drag line shall be left in all empty conduit.

C. BOXES

1. The Contractor shall furnish and erect all pull boxes indicated on the plans or where required. Sides, top and bottom of pull boxes shall be zinc coated and shall be built of No. 12 USSG steel reinforced at corners by substantial angle irons and riveted or welded to plates. Bottom or side of pull boxes shall be removable and held in place by corrosion resistant machine screws. Pull boxes in damp locations shall have threaded hubs and gaskets. All pull boxes shall be suspended from ceiling or walls in the most substantial manner.
2. For large boxes, sufficient suitable porcelain clamp insulators or other approved devices shall be provided in the pull boxes for supporting the cables passing through the box so that the cables will not be unsupported for a distance greater than three (3) feet and so as to permit a neat and orderly arrangement of the cables.
3. For pull boxes having the largest side more than nine (9) square feet in area, special rectangular and diagonal angle-iron bracing will be required as approved.
4. Pull boxes of special or odd shapes are required to be installed by the Contractor, even though not shown on plans, where necessary to overcome interference or to facilitate the pulling of conductors in conduits.
5. In centering outlets, the Contractor is cautioned to allow for overhead pipes, ducts and other obstructions, and for variations in arrangement and thickness of fireproofing, soundproofing and plastering. Precautions should be exercised regarding the location of window and door trims,

paneling, etc. Mistakes resulting from failure to observe these precautions, must be corrected by the Contractor without cost to the City. Outlets in hung ceilings shall be supported from the black iron or structure.

6. The exact location of all outlets in finished rooms shall be as directed. When the interior finish has been applied, the Contractor shall make any necessary adjustment of its work to properly center the outlets. All outlet boxes for local switches near doors shall be located at the strike side of doors as finally hung, whether so indicated on the drawings or not.
7. Exposed wall outlet boxes shall be erected neatly and tight against the walls and securely anchored to same.
8. All wall outlets of each type shall be set accurately at the same level on each floor, except where otherwise specified or directed. Where special conditions occur, outlets shall be located as directed.
9. **MOUNTING HEIGHTS** - The following heights are standard heights and are subject to correction due to coordination with Contract Drawings. All such changes must be approved by the Resident Engineer. Heights given are from finished floor to center line of outlet or device on wall or partition, unless otherwise indicated.

a. General Convenience Outlets	
(mount vertical)	1'-6"
b. Clock Outlets	8'-6" or 1'-6" below ceiling
c. Wall Lighting Switches	4'-0"
d. Motor Controllers	5'-0"
e. Motor Push-button	4'-2"
f. Telephone Outlets	As Directed
g. Fire Alarm Bells	8'-6" or 1'-6" below ceiling
h. Fire Alarm Stations	4'-0"
i. Intercom Outlet	1'-6"
j. Cooking and Refrigerator Unit	As Directed
10. Outlet boxes shall be of approved design and construction; of form and dimensions suited and adapted to its specific location; the kind of fixture to be used and the number and arrangements of conduits, etc., connecting therewith. All ferrous outlet boxes shall meet the requirements for zinc coating as specified under Electrical Conduit Systems.
11. There shall be knockouts opened only for the insertion of conduit. Any outlet boxes with more openings than are necessary for conduit insertion, shall be sealed by the Contractor without additional charge.
12. All outlet boxes and junction boxes for exposed work shall be galvanized cast iron or cast aluminum with threaded openings. Outlet boxes for exposed inside work in damp locations shall be galvanized cast iron or cast aluminum with threaded hubs and neoprene gaskets.
13. Junction boxes shall not be less than 4 11/16" square and shall be equipped with zinc coated plates. Where plates are exposed they shall be finished to match the room decor.
14. **FIXTURE SUPPORTS** - Outlet boxes supporting lighting fixtures shall be equipped with fixture studs held by approved galvanized stove bolts or integral with the box. Cast iron or malleable boxes shall have four (4) tapped holes for mounting required cover or fixtures.
15. Outlet boxes exposed to the weather or indicated W.P., shall be cast iron or cast aluminum and the covers made watertight with neoprene gaskets. The boxes shall have external lugs for mounting. Drilling of the body of the fitting for mounting will not be permitted. The cover screws shall be appropriate in size, noncorrodible and not less than four (4) in number for each box opening.

PART E - ELECTRICAL WIRING DEVICES (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **WALL SWITCHES** shall be of the best specification grade, quiet type, and shall have a rating of 20 Amperes at 277 volts, as manufactured by Bryant, Hubbell or approved equal. The mechanism shall be equipped with arc snuffers. They shall be of the tumbler type, single pole. Switches of the 3-way type shall have a similar rating.
- B. **RECEPTACLES**
 - 1. **CONVENIENCE OUTLETS** - shall be of the best specification grade, duplex, two-pole, 3-wire, 15 Amperes at 125 volts. It shall have a grounding pole that shall be grounded to the conduit system. Receptacles shall be capable of both back and side wiring and shall have only one (1) grounding screw. Receptacles shall be Hubbell Cat. #5262 or approved equal.
 - 2. **HEAVY DUTY RECEPTACLE OUTLETS** - shall have the Ampere rating and the number of poles specified on the Contract Drawings and shall be Hubbell, Russell-Stoll, Bryant, AH & H or approved equal. Each outlet shall have a grounding pole, which shall be grounded to the conduit system.
 - 3. **FLOOR RECEPTACLES** - shall be Russell & Stoll #3040 or approved equal, to fit into floor box previously specified.
 - 4. **NAMEPLATES** - are required for all receptacles other than 120V.
- C. **CLOCK HANGERS** - Clock outlets for surface type clocks shall be equipped with a supporting hook and recessed faceplate to conceal the electrical cord.
- D. **WATERTIGHT DEVICES** - For installations exposed to weather or in damp locations, the devices shall be in a gasketed, cast iron enclosure.
- E. **PLATES**
 - 1. Every convenience outlet and switch outlet shall be covered by means of a stainless steel No. 302 - 0.4" antimagnetic plate with an approved finish, unless provided otherwise in the detailed Specifications.
 - 2. Where two (2) or three (3) switches are grouped together a single faceplate shall be used. Where more than three (3) switches are located at one (1) point, the faceplates may be made up in multiple units.

PART F - ELECTRICAL CONDUCTORS AND TERMINATIONS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. **CONDUCTORS FOR LIGHT AND POWER** - All wire and cable shall be of annealed copper of 98% conductivity. Aluminum wire or cable will not be permitted. The insulation shall be flame retardant, moisture and heat resistant, thermoplastic, type THW or THWN rated for 600 volts at 75 degrees C. for both wet and dry locations. Wires No. 8 or larger shall be stranded. Wires and cables shall also be subject to the requirements of the NYCEC. Cables for incoming service or wire in conduits contiguous with the earth or in concrete or other damp or wet locations shall be synthetic rubber insulated with neoprene jacket, heat and moisture resistant and shall be equal to UL Type USE and rated for 600 volts at 75 degrees C. for both wet and dry locations.
- B. **FIXTURE WIRE** - Lighting fixtures shall be wired with No. 14 gauge wire designated as AWM and rated at 105 degrees C.
- C. **OTHER TYPES** - Cables and wires for interior communication systems are described in detailed

Specifications of applicable Contracts.

- D. MINIMUM SIZE - Conductors smaller than No. 12 AWG shall not be used for light or power.
- E. COLOR CODE - Wires shall have a phase color code, and multiple conductor cables shall be color coded.
- F. CABLE DATA - The Contractor shall submit for approval the following information for each size and type of cable to be furnished.
 - 1. Manufacture of Cable - Location of Plant.
 - 2. Minimum insulation resistance at standard test temperature.
 - 3. Days required for delivery to site of work after order to proceed with manufacture.
- G. ORIGINAL REELS - Cable and wire shall be delivered to the site of the work on original sealed factory reels.
- H. TESTS
 - 1. NOTIFICATION OF TEST - No cable shall be released for shipment from the mill unless authorized by the Commissioner. The Contractor shall give the Commissioner at least 10 days notice when the cable will be available for testing at the mill. The Contractor's representative or inspector shall have access during working hours to all parts of the plant where the cable is being manufactured, and all reasonable inspection and testing facilities shall be afforded to the Contractor without increase in price to the City. The Inspector shall witness the complete test of cable and receive a copy of all test data.
 - 2. TEST DATA - The Contractor shall forward to the Commissioner six (6) copies of all test data for approval before accepting shipment of the cable.
 - 3. INSPECTION DURING MANUFACTURE - The Commissioner reserves the right to dispatch a representative to the factory at any time during the period of manufacture of the cable for the purpose of expediting or checking progress. The living and traveling expenses of the City Engineers making these inspections and witness tests will be borne by the City of New York.
 - 4. TEST IN CITY LABORATORY - Sufficient additional length of conductor shall be provided on each reel, so that a six (6) foot sample may be removed for testing in the City's Laboratories. This sample shall be cut from the reel in the presence of the Inspector of the Department of Design and Construction and cut in two (2) three-foot lengths, each piece to be tagged showing reel number, size and type, manufacture, date, name or project & Contract number. Samples shall be handed to the Inspector for transmittal. If it is found as the result of test that the cable does not comply with the approved factory test the Contractor will be ordered to remove all cable which came off the reel and has been installed, and to replace the defective cable not used, without cost to the City. The Contractor will be held responsible for any delays in the construction program caused by the defective cable.
 - 5. FINAL FIELD TEST - After conductors are installed and connected, the City will test the work for overall insulation resistance. The Contractor shall furnish all test equipment necessary. To be acceptable, the test shall meet the requirements set forth in the NYCEC.
- I. WIRE INSTALLATION
 - 1. INSTALL WIRES AFTER PLASTERING - Feeder and branch circuits wiring shall not be installed in conduit before the rough plastering work is completed. No conductors shall be pulled into floor conduits before floor is poured.

2. CONDUIT SECURED IN PLACE - No conductor shall be pulled into any conduit run before all joints are made up tightly and the entire run rigidly secured in place.
3. WIRE ENDS - All wires shall be left with sufficiently long ends for proper connection and stowing.
4. PULLING COMPOUNDS - When required to ease the pulling-in of wires into conduit, only approved compounds as recommended by cable manufacturers shall be used.
5. PRESSURE CONNECTORS - for wires shall be of the cast copper or forged copper pressure plate type. Connectors shall be O.Z., Burndy, National Electric Products or approved equal.
6. Splices and feeder taps in the gutters of panel boxes shall be made by means of pressure plate type connectors encased in composition covers as manufactured by O.Z., Burndy, National Electric Products or approved equal.
7. Splices in branch wiring for sound systems and fire systems, shall be first made mechanically secure, then soldered and taped.
8. In lieu of soldered splices (except for sound and Fire Systems, which must have soldered splices) the following alternates are acceptable for operating temperatures up to 105 degrees C., for fluorescent fixtures and for the splicing of branch circuit wiring up to No. 8 AWG wire:
 - a. Mechanical splices made with mechanical connectors as manufactured by the Minnesota Manufacturing Company "Scotchlock" or approved equal. Mechanical connectors requiring a special tool (pressure connectors, insulators and locking rings) by Buchanan or approved equal. The tool used for connector application shall be as approved by the connector manufacturer.
 - b. For wire and cable No. 6 AWG and larger for branch circuit wiring the seamless tubular connector will only be accepted. Application of this connector shall be with a tool recommended by the connector manufacturer.
9. TAGS - All feeders and risers shall be tagged at both ends, and in all pull and junction boxes and gutter spaces through which they pass. Such tags shall be of fiber and have the feeder designation and size stamped thereon.
10. BRANCH CIRCUIT WIRING
 - a. The Contractor installing branch circuit wiring shall test the work for correct connections and leave all loop splices in the fixture outlet boxes properly spliced and taped. The Contractor shall provide wire ends long enough for convenient connection to device.
 - b. NEUTRALS - No common neutrals shall be used except for lighting branch circuits. Each neutral wire shall be terminated separately on a neutral busbar in the panelboard. No common neutrals will be permitted for convenience receptacle branch circuits.

J. TERMINATIONS

1. LUGS - All lugs for all devices and all cable terminations shall be copper. AL/CU rated lugs will not be permitted. The only exception to this requirement is when the particular device is not manufactured with copper lugs by any manufacture. Lugs for No. 6 AWG cable and larger shall be cast copper or forged copper pressure plate type. Lugs for 1/0 and larger shall be fastened with two (2) bolts.
2. All lugs shall be of the proper size to accept the cable connected to them. Any Contractor furnishing a device containing lugs is to coordinate with the Electrical Work Contract Documents to insure that the device terminations are adequate for the wire or cable (whose size may be larger than expected due to voltage drop considerations) connected to the device. This requirement

applies to both the Contractor for Electrical Work whose branch circuit protector must have lugs of the proper size, as well as to the Contractor who furnishes the device who may have to increase the size of that particular device.

PART G - CIRCUIT PROTECTIVE DEVICES (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

SCOPE - This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panelboards and Service Entrance.

A. CIRCUIT BREAKERS

1. **CIRCUIT BREAKERS** shall be operable in any position and shall be of the quick-make, quick-break type on manual operation. The handle shall be trip free, preventing contacts from being held in closed position against abnormal overloads or short circuits. Positive visual indication of automatic tripped position of breaker shall be provided, in addition to the "On" and "Off" indication. All circuit breakers shall be of the bolted type.
2. **TRIP RATING** - Circuit breakers shall be provided with the required number of trip elements, calibrated at 40 degrees C., ambient temperature, in accordance with wire sizes or motor currents as shown on Contract Drawings or indicated in the Specifications.
3. **POLE BARRIERS** - Multipole pole breakers shall be designed to break all poles simultaneously. They shall be provided with barriers between poles and arc suppressing devices.
4. **ELEMENTS** - Multipole circuit breakers shall have frames of not less than a 100 Ampere rating. Multipole circuit breakers for 480 volts AC operation shall have an NEMA interrupting rating of 18,000 Amperes, unless a higher rating is specified in the Specific Requirements or indicated on the Contract Drawings.
5. For circuit breakers with frame size up to and including 225 Amperes, the breakers may be provided with non-interchangeable trip elements. For frame ratings above 225 Amperes, the breakers shall be provided with interchangeable trip elements, which can be replaced readily.
6. The trip rating of all circuit breakers shall not exceed 70% of frame rating.
7. Single pole circuit breakers for branch circuits shall have a frame size of no less than 100 Amperes, and shall be rated at 125 volt A.C. with a NEMA interrupting rating of 10,000 Amperes, unless a higher rating is specified in the Specific Requirements or indicated on the Contract Drawings.
8. **INVERSE TIME ACTION** - The circuit breakers shall be dual element type, one (1) element with time limit characteristics, so that tripping will be prevented on momentary overloads, but will occur before dangerous values are reached, the other with instantaneous trip action. Inverse time delay action shall be effective between a minimum tripping point of 125% of rating of breaker and an instantaneous tripping point between 600% and 700% of rated current.
9. **CONSTANCY OF CALIBRATION** - The tripping elements shall insure constant calibration and be capable of withstanding excessive short circuit conditions without injury.
10. **CONTACTS** shall be non-welding under operating conditions and of the silver to silver type.
11. **TEMPERATURE RISE** - Current carrying parts, except thermal elements shall not rise in temperature in excess of 30 degrees C. while carrying rated current at rated frequency.
12. **NUMBERING** - Each circuit breaker shall be distinctly numbered when installed in a group with other breakers. The calibration of trip element shall be indicated on each breaker.

B. SAFETY SWITCHES

NEMA TYPE HD - When safety switches are permitted to be used for service entrance, motor disconnecting means or to control other types of electrical equipment, they shall be of the type HD of a rating not less than 30 Amperes. Enclosures shall be provided with means for locking. For ratings above 60 Amperes terminals shall have double studs.

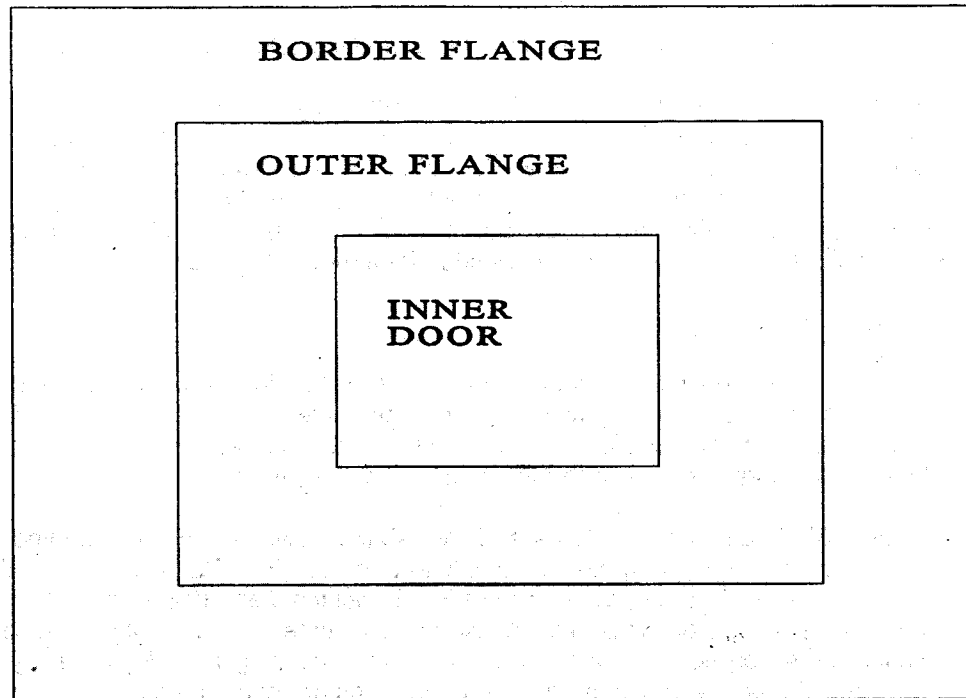
PART H - DISTRIBUTION CENTERS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

SCOPE - This Section sets forth the construction and installation procedure for Switchboards, Panelboards and Cabinets.

- A. PANELBOARDS--GENERAL TYPE** - The panelboards shall be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers shall be in accordance with the requirements outlined under "Circuit Protective Devices."
- B. NUMBER AND RATING OF CIRCUIT BREAKERS** - The Contract Drawings show a layout of each panel, giving the number, frame, size and trip setting of circuit breakers and number of branch circuits and spare breakers. Each branch circuit shall be distinctly numbered.
- C. BUS-BAR CONSTRUCTION AND SUPPORT** - Panel Boards shall be of the deadfront type and shall have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers shall be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard shall be designed for the frame rating of the Service Breaker. Bus bars shall run up the center of the panel, unless otherwise indicated, and shall have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panelboard shall be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers shall be used. A neutral bus of at least the same capacity as a live bus bar shall be provided for the connection of all neutral conductors. Each terminal shall be identified. All current carrying parts, exclusive of circuit breakers, shall be of copper with a minimum number of joints. The bus bar structure shall be a self supporting unit, firmly fastened to a 1/2 inch plastic board, extending the full length and width of assembly which shall serve to insulate the bus structure from the back of panel box. Other methods affording equally effective bus structure support and insulation will be given consideration. An insulating barrier shall separate neutral bus from other parts of panel.
- D. CIRCUIT BREAKER ASSEMBLY** - The entire circuit breaker and bus bar assembly shall be mounted on an adjustable metal base or pan and secured to the back of panel box. The panel shall have edges flanged for rigidity.
- E. PANEL MOUNTING** - The panel shall be centered in the panel box to line up with door openings and set level and plumb so that no live parts are exposed with the door open.
- F. PANEL CABINET CONSTRUCTION AND SUPPORT**
1. Panel boxes shall be fabricated from No. 12 USSG sheet steel of no more than three-piece construction, reinforced at the corners and with continuous welds. Boxes having a back whose area is larger than 16 square feet, shall be of No. 10 USSG sheet steel and reinforced to provide ample stiffness and to prevent buckling. Boxes shall be of sufficient size to afford a clear gutter space on all sides, of not less than six (6) inches.
 2. **PANEL CABINET INSTALLATION** - When installed surface, or in panel closets, they shall be mounted on Kindorf channel, supported from floor slab to ceiling slab.
 3. Where cabinets cannot be set entirely flush due to shallow walls or partitions or where cabinet is extra deep, the protruding sides of cabinet shall be trimmed with a metal or hardwood return

molding of approved design and fastened to cabinet so as to conceal the intersection between the wall and cabinet.

- G. **CABINET TRIM** - Trim for both lighting and power panelboards shall be door-in-door type installation as depicted in **DETAIL A TRIM FOR LIGHTING AND POWER PANELBOARDS**. Construction details are to be as described in the following paragraphs.



DETAIL A TRIM FOR LIGHTING AND POWER PANELBOARD

1. **CABINET TRIM** - The trim and doors for lighting and power panels shall be made of No. 12 USSG full finish sheet steel in one (1) piece. Cabinet trim larger than 16 square feet shall be made of No. 10 USSG. The inner door shall cover the circuit breaker section only and be provided with appropriate brass hinges. The outer door shall cover the entire gutter space and shall be attached to the border type flange with appropriate hinges. Both doors for power panels shall be provided with a New York City Lock No. 511S, with key change to No. 47 and two (2) keys. For lighting panels, the inner door shall be provided with a substantial catch. All hinges shall be of the concealed type. Locks shall be flush with trim. In addition, for panels requiring doors over 48 inches in height, furnish a vault handle and a 3-point catch arranged to fasten door at top, bottom and center.
 2. The door shall close against a flange or rabbet to afford a dust tight fit. All space between the panel and the cabinet trim shall be closed by means of a sectional plate secured to the trim.
 3. The border flange of the trim shall be fastened to the box with oval head screws finished to prevent corrosion or with approved trim clamps.
 4. To facilitate installation of trim, a suitable angle iron shall be spot welded across the bottom of each trim to carry the weight of the trim while the holding screws are being put in place.
- H. **MOTOR CONTROL CENTERS** - Motor centers shall be furnished by the Contractor as indicated in the Specifications or Contract Drawings, but shall be installed by the Contractor for Electrical Work.
- I. **NAMEPLATES** - Nameplates where required, shall be made of engraved Lamicoid sheet, or approved

equal. Letters and numbers shall be engraved white on a black background (except for Firehouse projects which shall have white letters on a red background) the Contractor shall submit an engraved sample for approval as to design and style of lettering before proceeding with the manufacture of the nameplate. Nameplates shall be of suitable size and shall also be provided at the top of the switchboard or section thereof and on the trim at the top of all lighting and power panels. Similar nameplates shall also be provided for each distribution circuit breaker giving the breaker number, the number of the feeder, and the name of the equipment fed.

- J. SHOP DRAWINGS - showing all details of boxes, panels, etc., shall be submitted for approval.
- K. DIRECTORIES - A directory shall be fastened with brass screws and consist of a noncorrosive metal frame with dimensions not less than five (5) inches x eight (8) inches and a transparent window of Plasticile, Plexiglass, Lucite or approved equal that is not less than 1/16 inch thick over cardboard or heavy paper. The directory shall be typewritten and show the number of each circuit, the name of circuit and lighting or equipment supplied. The size of riser feeder shall be as indicated on directory. The dimensions of directory shall be submitted for approval for each size of panel.
- L. CONSTRUCTION
 - 1. FINISH - Panel boxes, doors and trim for installation in dry locations, shall be zinc coated after fabrication by the hot-dip galvanizing or electroplate process on inside and outside surfaces. In damp locations, panelboards shall be enclosed and gasketed NEMA 3R type. Panelboards located outdoors or exposed to the weather shall be cast iron.
 - 2. PAINTING - Panel boxes, doors and trim shall receive a coat of approved priming paint and a second coat of approved paint in the field after installation. Paint shall be applied to the inside and outside of boxes and on both sides of trim. Panel trims and doors shall receive a third or finishing coat on the outside after installation. Approval as to texture and color must be obtained before the final coat is applied. All of the aforementioned painting is to be done by the Contractor who furnishes the boxes and trim. Where panel trims or boxes are installed on walls which are to be painted, the previously mentioned third or finishing coat of paint shall be included in the work of the Contractor who has the Contract for general interior painting.

PART I - MOTORS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

SCOPE - This Section sets forth the general design, construction and performance requirements, which shall apply to all motors furnished in any of the Contracts.

- A. MOTOR DESIGN - All motors shall be designed to comply with the New York State Energy Code currently in effect. Motors shall have standard NEMA frames and shall have nameplate ratings adequate to meet the specified conditions of operation. Motor performance under variable conditions of voltage and frequency shall be within the limits set in NEMA standards, unless modified in present Specifications. Motors shall be expressly designed for the hazard duty load, voltage and frequency as specified in the Contract. All motor windings shall be copper. All motors intended to operate on a 208 volt system shall be designed and rated for 200 volts.
- B. MOTORS OF SAME MANUFACTURER - Unless expressly permitted otherwise by the Commissioner, all motors under the same Contract shall be manufactured by the same company. Exceptions may be granted in the case of motors of 1/4 horsepower rating and smaller, or for a motor that is an integral part of the equipment, with its housing especially built for this purpose.
- C. STANDARDS OF COMPARISON - In general, the best standard products of the leading motor manufacturers shall be considered as a standard for comparison. The requirements of the NEMA standards for motors and generators shall be deemed to contain the minimum requirements of performance and design.
- D. OBJECTIONABLE NOISES - Objectionable noises will not be tolerated and exceptionally quiet motors

may be required for certain specified locations. Noise control tests as per the Building Code of the City of New York may be performed as directed by the Commissioner. Such motors shall bear a nameplate lettered "Quiet Motor." Springs and slip rings shall be of approved non-ferrous material.

E. BEARINGS

1. Bearings, unless specified otherwise, shall be of the ball or roller type. Motors one (1) horsepower and larger that are equipped with ball roller bearings shall also have lubrication of the pressure-relief greasing type. Each Contractor who furnishes four (4) or more such motors shall also furnish, as part of its Contract, a pressure grease gun of rugged design, of approximately 10 ounce capacity, complete with necessary adapters. The Contractor shall also provide 10 pounds of approved gun grease.
2. For any particular unit where sleeve bearings are deemed desirable, permission for their use may be granted by the Commissioner. Motors one (1) horsepower and larger that are equipped with sleeve type bearings shall in addition to having protected accessible fittings for oiling be provided with visible means for determining normal oil level. Lubrication shall be positive, automatic and continuous.

F. MOTOR TERMINALS AND BOXES - Each motor shall be furnished with flexible leads of sufficient length to extend for a distance of not less than three (3) inches beyond the face of the conduit terminal box. This box shall be furnished of ample size to make and house motor connections. These requirements shall be met irrespective of any other standards or practices. Size of cable terminals and conduit terminal box holes shall be subject to approval. For motors five (5) horsepower or larger, each terminal shall come with two (2) cast or forged copper pressure type connectors with bolts, nuts and washers. For motors of smaller ratings, connectors of other acceptable types may be furnished. For installations exposed to the weather or moist locations, terminal boxes shall be of cast iron with threaded hubs and gasketed covers. Cover screws shall be of non-corrosive material.

G. MOTOR TEMPERATURE RISES - The motor nameplate temperature rises for the various types of motor enclosures shall be as listed below:

- | | |
|---|---------------|
| 1. Open Frame | 40 degrees C. |
| 2. Totally enclosed and enclosed fan cooled | 55 degrees C. |
| 3. Explosion proof and submersible | 55 degrees C. |
| 4. Partially enclosed and drip proof | 40 degrees C. |

The temperature of the various parts of a motor shall meet the requirements of NEMA standards for the size and type of the motors. Tests for heating shall be made by loading the motor to its rated horsepower and keeping it so loaded for the rated time interval or until the temperature becomes constant.

H. SPECIAL CODE INSTALLATIONS - Electrical installations covered by special publications of NBFU and by special City rulings and regulations shall comply in design and safety features with such applicable codes, regulations and rulings, and shall be furnished and installed complete with all accessories and safety devices as therein specified.

I. MOTORS ON LIGHTING PANELS - The largest A.C. motor permitted on branch circuits of lighting panels shall not exceed 1/4 horsepower.

J. MOTORS RATED 1/2 horsepower and larger shall be polyphase.

K. TESTS

1. **FACTORY INSPECTION** - Electrical equipment and devices (except portable) not covered by standard Specifications or tests herein prescribed shall be inspected and witnessed on test at the factory with the tested equipment being completely assembled and connected under conditions approved by the Commissioner as equivalent to the actual working conditions. Suitability and

ruggedness of the design for the specified purpose will be a condition for acceptance.

2. **SHOP TESTS** - to determine the load performance of motors shall be made in accordance with Standard C-50, of the ASA. Motors shall meet the requirements of C-50 for insulation resistance, dielectric strength, efficiency and temperature rise. Efficiency (and power factor for A.C. motors) shall be established for 50, 75 and 100 percent of rated horsepower but for motors of 100 horsepower or larger, the 125 percent loading shall be included.
3. **TEST REPORTS** - The result of shop tests shall be submitted to the Commissioner for approval and shall be on forms approved by the City. The evaluated test data shall include a signed statement confirming the fact that the equipment meets the requirements of the standards of performance.
4. **MANNER OF TEST** - For motors of 100 horsepower or smaller, check tests against complete tests of similar motors will be accepted. For motors larger than 100 horsepower, complete tests for each motor furnished shall be made, and certified test data sheets shall be submitted for approval, unless shop tests are required by the Detailed Specifications.
5. **PREFERRED METHODS** - The efficiency of fractional horsepower motors shall be determined by the input-output method; for larger motors up to and including 100 horsepower, the separate loss method as specified in ASA Standards C-50 will be accepted unless otherwise required in the Specifications.
- L. **SPARE PARTS** - The Contractor who furnishes motors, including fractional horsepower, shall provide the following spare parts and accessories in connection therewith:
 1. **BRUSHES** - One (1) additional set of brushes for each motor equipped with them.
 2. **BEARINGS** - For each group of three (3) and fraction thereof, of each type and size of motor, the Contractor shall furnish one (1) set of extra bearing linings or ball or roller bearings. Where less than three (3) of any type of motor is involved, one (1) set of extra bearings shall be furnished.
 3. **SPRINGS** - One (1) set of brush springs used in slip ring motor or universal type motors.
 4. **WRAPPER MARKING** - All parts shall be delivered neatly and securely wrapped and boxed, plainly tagged and marked for identification and reordering.

PART J - MOTOR CONTROL EQUIPMENT (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

SCOPE - This Section sets forth the requirements for motor controllers and associated devices, which are applicable to all Contracts under which motor control equipment is furnished or installed.

- A. **MANUFACTURER** - All control equipment furnished under one (1) Contract shall be the product of a single manufacturer. Exceptions to this rule may be granted in the case of controllers for fractional horsepower motors driving special equipment, the various units of which have been engineered to obtain specific performance.
- B. **CONTROL ITEMS REQUIRED** - The Contractor who furnishes a motor shall also furnish therewith complete disconnecting, starting and control equipment as required by the detailed Specifications, the various code authorities and for the successful operation of the driven equipment. These items include circuit breaker, magnetic starter with overload protection and low voltage release or protection, push button stations, pilot lights and alarms, float, pressure, temperature and limit switches, load transfer switches, devices for manual operation and speed controllers, etc. The Contractor shall furnish as many of these items as are required for the successful operation of the driven unit.
 1. Where a motor is to be located out of sight of the controller, the Contractor who furnishes the motor shall furnish an approved disconnecting means to be mounted near motor.

C. TYPES OF STARTERS

1. SQUIRREL CAGE - A.C. motors of the squirrel cage type, rated from one (1) to 30 horsepower shall have magnetic across the line starters; motors rated above 30 horsepower shall be furnished with reduced voltage (autotransformer type) starter or part winding start with time delay to reduce inrush current. Size of starters shall be based on 200V. operation.
2. SLIP RING - A.C. Motors of the slip-ring type shall be furnished with primary across the line starters interlocked with secondary starting and regulating equipment. The interlocking feature shall prevent starting of the motor when the secondary controller is off the initial starting point.
3. MAGNETIC - For fractional horsepower motors, magnetic type starters are not required unless the particular method of controlling the driven equipment makes them necessary. Where individual single phase fractional horsepower motors or the sum of fractional horsepower motors controlled by an automatic device are $\frac{1}{2}$ horsepower or more, magnetic starters and circuit breakers shall be used. Single phase A.C. motors smaller than $\frac{1}{2}$ horsepower or three-phase A.C. motors smaller than one (1) horsepower where manual control is specified may be furnished with starters of toggle switch or push button type with inbuilt thermal protection. No additional disconnecting means is required to be furnished with this type of starter. This type of starter may also be used in series with automatic control devices such as thermostats, float and pressure switches, provided the individual motor or the sum of fractional horsepower motors is less than $\frac{1}{2}$ horsepower. Means for manual operation shall be provided.

D. DISCONNECTING BREAKER - All motor starters, unless otherwise specified shall be provided with a disconnecting means in the form of a circuit breaker of the type specified under "CIRCUIT PROTECTIVE DEVICES" of the General Conditions. This disconnecting means shall be contained in the same housing with the starter and shall be operable from outside. Means shall be provided for locking the handle of the circuit breaker in the "OFF" position if it is desired to take the equipment out of service and prevent unauthorized starting.

E. CONTROL CABINET - DRY LOCATIONS - all starters shall be furnished with general purpose, NEMA Type 1, sheet metal enclosures with hinged covers and baked enamel finish.

F. CONTROL CABINET - WATERTIGHT - In wet locations, cast iron watertight enclosures with threaded hubs, galvanized and gasketed hinged covers shall be provided.

G. 1. PANELS - Motor control devices and appliances shall be mounted on approved insulating slabs with all wiring and connections made on the back of the slabs.

2. WIRING AND TERMINALS - Wiring connections for currents of 100 Amperes or less may be made with copper wire or cable with special flameproof insulating coverings. Such wires shall be installed in a neat workmanlike manner, flat against the slab, and held in place by clips. Connections shall be made with pressure connectors for No. 8 AWG and larger wires, and with grommets for small stranded wires. Except for incoming and outgoing main leads, all connections shall terminate on approved connector blocks, which may be installed on the face of the slab. For small, across the line starters the above requirements may be modified if satisfactory connections are provided.

3. COPPER BUS - For currents exceeding 100 Amperes, copper bus shall be used in place of wires. The bus shall be constructed of copper rods, tubing or flat strap, bent and shaped properly and securely attached to the slab in a neat and workmanlike manner. The cross section of copper shall provide sufficient areas to keep current density at not more than 1,000 Amperes per square inch.

H. COOPERATION - The Contractors who furnish electrically operated equipment shall give to the Contractor for Electrical Work full information relative to sizes and locations of apparatus furnished by them which require electrical connections.

Equipment being installed by the Contractor for Electrical Work shall be delivered to the Contractor for Electrical Work by other Contractors in proper time and sequence so that the Contractor for Electrical Work shall be able to meet the Contractor for Electrical Work working schedule.

I. SPARE PARTS

1. **FURNISH** - Each Contractor shall furnish the following spare parts pertaining to equipment furnished by each Contractor.

One (1) set of contact fingers and springs and thermal elements for each three (3) (or fraction) of each size of magnetic contactor starter.

One (1) holding coil for each three (3) (or fraction) of each size of magnetic contactor starter.

2. **WRAPPER MARKING** - All parts shall be delivered to the Resident Engineer neatly wrapped and boxed and plainly tagged and marked for identification and reordering.

PART K - SCHEDULE OF ELECTRICAL EQUIPMENT

Schedule D requirements for electrical motor equipment may be included in one or more of the Specifications for the separate contracts for the Project. SCHEDULE D delineates the responsibilities of each separate contractor for electrical motor control equipment. SCHEDULE D is included in the Addendum to the General Conditions. In the event of any conflict between the Specifications and SCHEDULE D, SCHEDULE D shall take precedence; provided, however, in the event of an omission from SCHEDULE D (i.e., SCHEDULE D omits either a reference to or information concerning electrical motor equipment which is set forth in the Specifications), such omission from SCHEDULE D shall have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, shall remain in full force and effect.

1.38 Safety

- A. Each Contractor shall provide and maintain all necessary temporary closures, guard rails, and barricades to adequately protect all workers and the public from possible injury. Any Contractor requiring removal of these items shall be responsible for the replacement of same.

1.39 Interruption of Services and of Project Facilities

- A. **EVENING AND WEEKEND WORK** - Where the work makes temporary shutdowns of the services unavoidable, they shall be made at night or on weekends or at such times that will cause no interferences with the established routines and operations of the projects in question.

1. Where weekend or evening work is required due to unavoidable service shutdowns, such work shall be performed at no extra cost to the City.

B. INTERRUPTION OF PROJECT FACILITIES

1. The Contractor shall not interrupt any of the services of the project nor interfere with these in any way without the permission of the Commissioner. Such interruption, or interferences, shall be made as brief as possible, and only at such time stated.
2. Under no circumstances will the Contractor, or its workers, be permitted to use any part of the project as a shop, without the permission of the Commissioner.
3. Unnecessary noise shall be avoided at all times and necessary noise shall be reduced to a minimum.
4. The facility operates 24 hours per day seven (7) days a week. Toilet facilities, water and electricity

must be operational at all times. No services of the project can be interrupted in any way without the permission of the Commissioner. Careful coordination of all work with the Resident Engineer must be done to maintain the operational level of the project personnel.

5. Contractors shall schedule their work to avoid noise interference that will affect the normal functions of the project. In particular, construction operations producing noises that are objectionable to the project functions will be scheduled at times of day or night, day of the week, or weekend, which will not interfere with the project personnel. Any additional cost resulting from this scheduling shall be borne by the specific Contractor.
6. The Contractor shall arrange to work continuously, including overtime, if required, to assure that services will be shut down only during the time actually required to make the necessary connections to the existing work.
7. The Contractor shall give ample written notice in advance to the Commissioner and project personnel of any required shutdown.

1.40 Separation of Work Between Trades (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- A. SCHEDULE E – Requirements for various items of work are included in the Specifications for the separate contracts for the Project and in the General Conditions. Schedule E delineates the responsibilities of each separate contractor for various items of work, as well as the extent to which certain items involve coordination between trades. Schedule E is included in the Addendum to the General Conditions. The delineation set forth in Schedule E shall be taken as specific instruction to the Contractor that it is responsible for the listed items of work. Schedule E is not intended to limit the Contractor's responsibility for supervision and coordination as set forth in Paragraph B below. In the event of any conflict between the Specifications, the General Conditions and Schedule E, Schedule E shall take precedence; provided, however, in the event of an omission from Schedule E (i.e., Schedule E omits either a reference to or information concerning an item of work which is set forth in the Specifications or the General Conditions), such omission from Schedule E shall have no effect and the Contractor's obligation to perform the work, as set forth in the Specifications or the General Conditions, shall remain in full force and effect.
- B. SUPERVISION AND COORDINATION - Each Contractor is required to supply all necessary supervision and coordination information to any other trades who are to supply work to accommodate their installations.

1.41 Shop Drawing and Material Samples Schedule

- A. SCHEDULE F – Schedule F sets forth all submittal requirements for shop drawings and material samples. Schedule F is included in the Addendum to the General Conditions. At the kick-off meeting, each Contractor must review this Schedule with the Commissioner's Representative and the Consultant. Within 10 days after the kick-off meeting, the Contractor must complete information on Schedule F concerning the submission date, the required delivery date and the fabrication time. For all required submittals of shop drawings and material samples, the Schedule F provided by the Contractor must indicate a submission date which is at least 20 days prior to the date of the manufacture of the item or materials to be installed. In addition, if so directed by the Commissioner, the Schedule F provided by the Contractor must indicate a submission date for shop drawings and/or material samples of specified items or materials which is within 60 days after the kick-off meeting. In the event of any conflict between the Specifications and Schedule F, Schedule F shall take precedence; provided, however, in the event of an omission from Schedule F (i.e., Schedule F omits either a reference to or information concerning a submittal requirement which is set forth in the Specifications), such omission from Schedule F shall have no effect and the Contractor's submittal obligation, as set forth in the Specifications, shall remain in full force and effect.
- B. COORDINATION - The Resident Engineer for this project will coordinate and review the data submitted by various Contractors. Upon acceptance by the Resident Engineer, the Resident Engineer

will date and sign the schedule as approved and transmit it to the Consultant, Contractors and Project Manager within the Department of Design and Construction.

- C. ARTICLE 11 - Thereafter, this schedule will be subject to the provisions of Article 11 of the agreement and must be strictly adhered to by the Contractor.

1.42 Specific Requirements

- A. The work of this article shall be the responsibility of the Contractor for General Construction Work, unless otherwise indicated.

B. FIELD MEASUREMENTS

1. Each Contractor shall verify all dimensions and conditions on the job so that all work will properly join the existing work.
2. Each Contractor, before commencing work, shall examine all adjoining work on which each Contractor's work is in any way dependent on good workmanship in accordance to the intent of the Specification and Contract Drawings. The Contractor shall report to the Commissioner any condition that will prevent any Contractor from performing work that is below the required standard.

C. BORINGS (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. REFERENCE DRAWINGS - The Boring Drawings as listed on the title sheet are for information to the bidder and are to be used under the conditions as follows:
2. BORING LOGS - shown on the Boring Drawings, record information obtained under engineering supervision in the course of exploration carried out by or under the direction of forces of the Department of Design and Construction at the site.
3. SOIL AND ROCK SAMPLES - All inferences are drawn from the indications observed as made by engineering and scientific personnel. All such inferences and all records of the work including soil samples and rock cores, if any, are available to bidders for inspection.
4. CERTIFICATION OF SAMPLES - The City certifies that the work was carried out as stated, and that the soil samples and rock cores, if any were referred to, were actually taken from the site at the times, places and in the manner indicated. The samples are available for inspection in the Department of Design and Construction Subsurface Exploration Section.
5. BIDDER'S RESPONSIBILITY - The bidder, however, is responsible for any conclusions to be drawn from the work. If the bidder accepts those of the City, it must do so at its own risk. If the bidder prefers not to assume such risk, the bidder is under the obligation of employing its own experts to analyze the available information, and must be responsible for any consequences of acting on their conclusions.
6. CONTINUITY NOT GUARANTEE - The City does not guarantee continuity of conditions shown at actual boring locations over the entire site. Where possible, borings are located to avoid all obstructions and previous construction which can be found by inspection of the surface and the bidder is required to estimate the influence of such features from its own inspection of the site.

D. DEFERRED CONSTRUCTION

1. Where necessity for deferred construction is certified by the Commissioner, in order to permit the installation of any item or items of equipment required to be furnished and installed under any other Contract in effect concurrent with the time allowed for doing and completing the work of the Contract, the Contractor shall defer construction work limited to adequate areas as approved by

the Commissioner.

2. The Contractor shall confer with the affected Contractors and ascertain arrangements, time and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

E. WORK FENCE ENCLOSURE (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. The Contractor shall furnish and erect a wood fence to the extent shown on the drawings enclosing the entire project on all sides. All materials used shall be new. Any permit required for the installation and use of said fence shall be borne by the Contractor.
2. THE FENCE shall be 7'-0" high with framing construction of yellow pine, using 4" x 4" posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which shall be secured boards, 3/4" x 6" tongue and groove, laid solid and surface and double nailed to each bearing. Posts shall be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence shall be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed. The Contractor has the option of using 1/2" exterior grade plywood in lieu of the 3/4" x 6" tongue and groove boards.
3. GATES - Provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates shall have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts shall be 6" x 6" and shall extend high enough to receive and be provide with tension or sag rods for the swinging sections.
4. PAINTING - The fence and gates shall be entirely painted on the street and public sides with two (2) coats of approved lead and oil paint. The below-grade section of the posts shall be first creosoted or given a coat of tar base paint. Black stenciled signs reading "POST NO BILLS" shall be painted on fence with three (3) inch high letters on 25 foot spacings for the entire length of fence on street traffic sides. Signs shall be stenciled five (5) feet above the sidewalk.
5. It shall be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.
6. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad shall be provided for protection of sidewalks.
7. Where required, make provision for fire hydrants, lampposts, etc.
8. REMOVAL - When directed by the Resident Engineer, the fence shall be removed.

F. PUMPING

1. Furnish and install all necessary automatically operated pumps of adequate capacity with all required piping to run-off agencies, so as to maintain the excavation, cellar floor, pits and exterior depressions and excavations free from accumulated water during the entire period of construction and up to the date of final acceptance of work of the Contract.
2. All pumps shall be maintained at all times in proper working order.

G. RESIDENT ENGINEER'S OFFICE

1. OFFICE SPACE IN EXISTING BUILDING (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)
 - a. The Resident Engineer will arrange for office space for sole use in the building where work is in progress. The Contractor for General Construction Work shall provide and install a lockset

for the door to secure the equipment in the room. The Contractor for General Construction Work shall provide two (2) keys to the Resident Engineer. After completion of the project the Contractor for General Construction Work shall replace the original lockset on the door and ensure its proper operation.

- b. The Contractor for General Construction Work shall provide one (1) telephone, where directed, for the exclusive use of the Resident Engineer. The Contractor for General Construction Work shall pay all costs for telephone service for calls within New York City limits for the duration of the project. The telephone service shall continue for a period of 90 days following substantial completion.
- c. The Contractor for General Construction Work shall provide the following equipment:
 - (1) Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two (2) lockers, metal olive green or gray, single units, 15" x 18" x 78" overall including 6" legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks approximately 52"H x 28 1/2"D x 18"W in a grey finish by Art Steel No. 2904L or approved equal.
 - (2) One (1) 9000 B.T.U. air conditioner or as directed by Commissioner. Wiring for the air conditioner shall be minimum No. 12 AWG fed from individual circuits in the fuse box.
 - (3) Two (2) metal wastebaskets, 13 inches square 15 inches high with rubber feet and corners by Art Metal Company No. 168 or approved equal.
 - (4) One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
 - (5) One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.

2. TRAILER OFFICE (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

- a. The Contractor for General Construction Work shall provide at its own cost and expense a trailer and install and connect all utility services to trailer within twenty (20) days of start of work. The trailer shall have equipment having the minimum requirements hereinafter specified. Any permit required for the installation and use of said trailer shall be borne by the Contractor.
- b. The trailer shall remain the property of the Contractor for General Construction Work except that the file cabinets herein specified, shall become the property of the City of New York.
- c. Trailer shall be office type trailer of the following general minimum dimensions:
 - 1. Length, overall: 35 feet.
 - 2. Length, inside: 32 feet.
 - 3. Width, overall: 8 feet.
 - 4. Width, inside: 7 feet, 5 inches.
- d. Trailer shall be manufactured by International Trailer Company, Model No. 1 MU-35-D or Atlantic Trailer Corporation, Model No. F-36 or approved equal.
- e. The exterior of the trailer and the wheels shall be given an approved coat of exterior enamel. The enamel finish coat shall be DUPONT orange lacquer or approved equal. The trailer shall be lettered with black block lettering of the following heights with white borders:

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES
RESIDENT ENGINEER'S OFFICE

2-1/2"
3-3/4"
3-1/2"
2-1/2"

NOTE: In lieu of painting letters on trailer the Contractor for General Construction Work may substitute a sign constructed of a good quality lumber with the same type and size of lettering above.

- f. All windows and doors shall have insect aluminum screens and wire mesh protective screening.
- g. The interior shall be finished in 1/4 inch plywood. Plywood shall be finished in natural color, with two (2) coats of varnish or lacquer.
- h. The interior shall be divided by partitions into one (1) large room in front of trailer, and a private office approximately 6' x 7' at rear of trailer and a washroom located adjacent to the private office.
- i. The washroom shall be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies by Hospital Supply and Watters Labs., Inc., Model No. 1 or approved equal and a toilet roll tissue holder. Plumbing and fixtures shall be approved house type, with each appliance trapped and vented and a single discharge connection. Five (5) gallon capacity automatic electric heater for domestic hot water shall be furnished.
- j. The heating system shall consist of thermostatically controlled electric baseboard heaters capable of delivering not less than 30,000 BTU per hour and heaters shall be as manufactured by Chromalox or approved equal, sized per area with individual approved thermostats.
- k. The trailer shall be equipped with an approved two-circuit, 110-120 volt armored cable wiring system of adequate capacity complete with entrance connector with provision for grounding, enclosed fused service switch and branch circuit fuse box. The circuits for lighting, water heater, heater and convenience outlets, etc. shall be two-conductor, No. 12. The circuits for the space heaters shall be sized minimum No. 12 wire led from individual circuits in the branch circuit fuse box. Metal boxes shall be provided at all outlet points. All wiring shall conform to the requirements of the Electrical Code of the City of New York for armored cable wiring systems.
- l. Lighting to be furnished by a minimum of four (4) 48 inch, single tube, fluorescent fixtures for the large rooms and an incandescent fixture for the washroom. Lighting fixtures shall be provided with built-in pull-chain switches. A minimum of six (6) duplex convenience outlets shall be installed; four (4) in the larger room and two (2) in the smaller room. These outlets shall be in addition to connections for electric space heaters and heaters for domestic hot water.
- m. In addition to the washroom and private office, the following shall be built-in to the trailer:
 - 1. The drafting or reference table at least 60 inches long by 36 inches wide with cabinet below, head shelf at each end of the trailer, wall type plan rack at least 42 inches wide and wardrobe opposite washroom.
- n. The following movable equipment shall be furnished:
 - 1. Four (4) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Four (4) lockers, metal olive green or gray, single units, 15" x 18" x 78" overall including 6" legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks approximately 52" H x 28 1/2" D x 18"W in a grey finish by Art Steel No. 2904L or approved equal.
 - 2. One (1) 6000 B.T.U. and one (1) 9000 B.T.U. air conditioner. Wiring for the air conditioners shall be minimum No. 12 AWG fed from individual circuits in the fuse box.

3. Two (2) metal wastebaskets, olive green or grey finish, 13 inches square 15 inches high with rubber feet and corners by Art Metal Company No. 168 or approved equal.
 4. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
 5. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.
- o. TRAILER TEMPORARY SERVICE - Plumbing and electrical work required for the trailer will be furnished and maintained as below.
1. PLUMBING WORK - shall include all water supply and drainage piping required for a complete installation. Contractor to provide a temporary water service from the City's water main and extend in the trailer and properly connect up all fixtures requiring water supply. Provide all necessary soil, waste, vent and drainage piping.
 - a. Plumbing Contractor to frost-proof all water pipes to prevent freezing.
 - b. REPAIRS, MAINTENANCE - The Plumbing Contractor provide repairs when and as required for a period of thirty (30) days after the date of substantial completion acceptance.
 - c. DISPOSITION OF PLUMBING WORK - At the expiration of the time limit set forth in Subparagraph 3, the water drainage connections and piping to the office trailer shall be removed and shall be plugged at the mains. All piping shall become the property of the Contractor for Plumbing Work and shall be removed from the site, all as directed. All repair work due to these removals shall be the responsibility of the Contractor for General Construction Work.
 2. ELECTRICAL WORK - The Contractor for Electrical Work shall furnish, install and maintain a temporary electric feeder to the trailer to be used by the Resident Engineer immediately after it is placed at the job site.
 - a. The temporary electric feeder shall be at least three (3) No. 6RH wire and shall be protected by a 60 Ampere fused safety switch, complying with codes and utility requirements having jurisdiction.
 - b. Make all arrangements and pay all costs to provide electric service.
 - c. Pay all costs for current consumed and for maintenance of the system in operating condition, including the furnishing of the necessary bulb replacements lamps, etc., for a period of thirty (30) days after the date of substantial completion acceptance.
 - d. Disposition of Electric Work: At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., shall be removed and disposed of as directed.
 - e. All repair work due to these removals shall be the responsibility of the Contractor.
- p. MAINTENANCE
1. The Contractor for General Construction Work shall provide and pay all costs for hot and cold water, heat and fuel and regular daily janitor service. Furnish toilet paper, cloth towels and soap and maintain the field office in first-class condition, including all repairs, until 30 days after the date of substantial completion acceptance.
 2. Provide fire, extended coverage and vandalism, malicious mischief and burglary and theft

insurance coverage for the Resident Engineer's field office equipment in the amount of \$10,000. All insurance coverage shall be provided by a company licensed and authorized to do business in the State of New York. Such coverage must, under the loss payable clause or by endorsement thereon, state the following: "loss, if any, payable to the City of New York."

3. At 30 days after the date of substantial completion acceptance, or sooner as directed by the Commissioner, the Contractor for General Construction Work shall have all services disconnected and capped to the satisfaction of the Resident Engineer.
- q. The Contractor for General Construction Work shall provide and pay all costs for the following telephone services for the Resident Engineer's trailer:
 1. Two (2) desk phones
 2. One (1) wall phone (with six (6) foot extension cord) at plan table.
 3. A remote bell located on outside of trailer
 4. The telephone service shall continue for a period of 90 days following substantial completion.
- r. Should it become necessary to relocate the trailer or move the field office from one (1) location to another, Contractor for General Construction Work shall be responsible for move or moves and of reconnecting all utilities described above at new location, and shall assume all costs incurred.
- s. PERMITS - The Contractor for General Construction Work shall make the necessary arrangements and obtain all permits required for this work.
- t. The Contractor for General Construction Work has the option of providing, at its cost and expense, rented office or store space in lieu of trailer. Said space shall be in the immediate area of the Project and have adequate plumbing, heating and electrical facilities. Space chosen by the Contractor for General Construction Work must be approved by the Commissioner before the area is rented. All insurance maintenance and equipment required for trailer field office shall also apply to rented spaces.

H. ADDITIONAL EQUIPMENT FOR THE RESIDENT ENGINEER (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. The Contractor for General Construction Work shall supply photo equipment not to exceed \$250. Said equipment to be specified by Resident Engineer. At the completion of the project, the equipment shall become the property of the City of New York.
2. The Contractor for General Construction Work shall provide a copy machine for paper sizes 8½ x 11 & 8½ x 14. Copier shall remain at job site 30 days beyond the Substantial Completion date.
3. The Contractor for General Construction Work shall furnish a fax machine and a telephone answering machine at commencement of the project. All materials shall be new, sealed in manufacturer's original packaging and shall have manufacturers' warranties. All items shall remain the property of the City of New York at the completion of the project.
4. Computer Workstation (Refer to the Addendum to the General Conditions for the number of Computer Workstations to be provided):

Computers shall be provided for all contracts that have a total duration of 180 Consecutive Calendar Days (CCDs) or more, as set forth in Schedule "A". Contracts that have a total duration of less than 180 CCDs shall not require computers. Computer workstations shall be provided for

the duration of the contract.

(1) Personal Computer(s) - Workstation Configuration.

- (a) Make and Model: Dell, Gateway, Toshiba, HP, IBM, or an approved equal. (Note: an approved equal requires written approval of the Assistant Commissioner of ITS.)
- (b) Processor: 3.0 GHz Pentium 4 or faster computer - Single Processor.
- (c) System RAM: Minimum of 1 GB (Gigabytes) of SDRAM or DDR.
- (d) Hard Disk Drive(s): 80 GB (Gigabytes) or larger.
- (e) CD-RW: Internal CD-RW, 48x Speed or faster.
- (f) 16xDVD+/RW: DVD Burner (with double layer write capability) 16x Speed or faster
- (g) I/O Ports: Must have at least one (1) Serial Port one, (1) Parallel Port, 2 USB Ports. Serial Ports must consist of UART 16550 Chip or better.
- (h) Video Display Card: PCI Interface with a minimum of 64 MB of RAM.
- (i) Monitor: 17" TFT LCD monitor.
- (j) Available Exp. Slots: System as configured above shall have at least two (2) full size PCI Slots available.
- (k) Fax/Modem: Internal Fax/Modem 56 Kbps speed, featuring 3COM or US Robotics Chipset and supporting a minimum of V.92 and MNP5 compliant. Integrated 10/100/1000 Ethernet.
- (l) Other Peripherals: Optical scroll Mouse, 101 Key Keyboard, Mouse Pad and all necessary cables.
- (m) Software Requirements: Microsoft Windows XP Professional, Microsoft Office 2003 Professional, Microsoft Project 2002 Professional, Adobe Acrobat reader, Anti-Virus software package with one year updates subscription, Win Zip and Auto Cad 2008 LT.

(2) All field offices requiring computers shall be provided with the following:

- (a) One (1) broad-band internet service account. This account will be active for the life of the project.
 - (b) One (1) 600 DPI HP Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper Tray (Legal Size)
 - (c) All necessary Cabling
 - (d) Storage Boxes for and Blank CDs/DVDs
 - (e) Printer Table
 - (f) UPS/Surge Suppressor combo
- (3) All Computer Hardware shall come with a three (3) year warranty for on-site repair or replacement. Additionally, and notwithstanding any terms of the warranty to the contrary, the Contractor is responsible for rectifying all computer problems or equipment failures within one (1) business day.

- (4) An adequate supply of blank CD's/DVD's, and paper and toner cartridges for the printer shall be provided by the Contractor, and shall be replenished by the Contractor as required by the Engineer.
- (5) It is the Contractor's responsibility to ensure that electrical service and phone connections are also available at all times; that is, the Field Office Computer(s) is to be powered and turned on twenty four (24) hours each day.

Broadband connectivity is preferred at each field office location. Please take into consideration that an extra phone line dedicated to the modem must be ordered as part of the contract unless Internet broadband connectivity, via Cable or DSL, is available at the planned field office location. Any questions regarding this policy should be directed to Raul Canabal, Assistant Commissioner of Information Technology Services at 718-391-1668.

I. PUBLIC TELEPHONE (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. The Contractor shall provide a public telephone located on the site, where directed, for the duration of the Contract.

J. HEAD PROTECTION (HARD HATS)

1. The Contractor shall provide a minimum of 10 standard protective helmets for the exclusive use of Department of Design and Construction personnel and their visitors. Helmets shall be turned over to the Resident Engineer and kept in the office of the Resident Engineer.
2. Upon completion of the project, the helmets shall become the property of the Contractor.

K. RODENT AND INSECT CONTROL

1. **DESCRIPTION** - The General Contractor shall provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and to control any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the project area. Special attention should be paid to the following conditions or areas:
 - a. Wet areas within the project area, including all temporary structures.
 - b. All exterior and interior temporary toilet structures within the project area.
 - c. All Field Offices and shanties within the project area of all Contractors and the Department of Design and Construction (DDC).
 - d. Wherever there is evidence of food waste and/or discarded food or drink containers, in quantity, that would cause breeding of rodents or the insects herein specified.
 - e. Any other portion of the premises requiring such special attention.
2. **MATERIALS:** All materials shall be approved by the New York State Department of Environmental Conservation and comply with the New York City Health Code, OSHA and the laws, ordinances and regulations of State and Federal agencies pertaining to such chemical and/or materials
3. **PERSONNEL:** All pest control personnel must be supervised by an exterminator licensed in categories 7A & 8.
4. **METHODS**

- a. Application and dosage of all materials shall be done in strict compliance with the manufacturer's recommendations.
- b. Under the Maintenance of Site item (section 1.42.L), any unsanitary conditions, such as uncollected garbage or debris, resulting from the General Contractor's activities which will provide food and shelter to the resident rodent population shall be corrected by the General Contractor immediately after notification of such condition by the Commissioner

5. RODENT CONTROL WORK

- a. In wetlands, woodlands and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait shall be used in areas within seventy-five (75) feet of all streambanks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.
- b. In areas outside the seventy-five (75) foot zone of protection adjacent to streams, and in areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait shall be placed during the period of construction and any consumed or decomposed bait shall be replenished as directed.
- c. At least one month prior to initiation of the construction work, and periodically thereafter, live traps and/or rodenticide bait in tamper proof bait stations, as directed above, shall be placed at locations that are inaccessible to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the project area.
- d. The General Contractor shall be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper proof bait stations. The General Contractor shall also be responsible for posting and maintaining signs announcing the baiting of each particular location.

The General Contractor, under his/her Maintenance of Site operations, shall be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the project area.

- e. It is anticipated that public complaints will be addressed to the Commissioner. The General Contractor, where directed by the Commissioner, shall take appropriate actions, like baiting, trapping, proofing, etc., to remedy the source of complaint within the next six (6) hours of normal working time which is defined herein for the purposes of this section as 7 A.M. to 6 P.M. on Mondays through Saturdays.
- f. Emergency service during the regular workday hours (Monday through Friday) shall be rendered within 24 hours, if requested by the Commissioner, at no additional cost to the City.

6. EDUCATION & TRAINING

- a. The General Contractor shall post notices on all Construction Bulletin Boards advising workers, employees, and residents to call the Engineer's Field Office to report any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the project area. The General Contractor shall provide and distribute literature pertaining to IPM techniques of rodent control to affected businesses and superintendents of nearby residential buildings to ensure their participation in maintaining their establishments free of unsanitary conditions, harborage removal and rodent proofing.
- b. Prior to application of any chemicals, the General Contractor shall furnish to the Commissioner copies or sample labels for each pesticide, antidote information, and Material Data Safety Sheets (MSDS) for each chemical used.

7. RECORDS AND REPORTS

- a. The General Contractor shall keep a record of all rodent and waterbug infestation surveys conducted by him/her and make available, upon request, to the Commissioner. The findings of each survey shall include, but not be limited to, recommended Integrated Pest Management (IPM) techniques, like baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.
- b. The General Contractor shall maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used.

L. SITE SECURITY/PERIMETER SIGNAGE

1. In order to properly convey notice to persons entering upon a City construction site, the Contractor shall furnish and install a sign at the entrance (gates) as follows:

NO TRESPASSING

AUTHORIZED PERSONNEL ONLY

2. If no construction fence exists at the site, this notice shall be conveyed by incorporating the above language into safety materials (barriers, tape, and signs).

M. MAINTENANCE OF SITE AND ADJOINING PROPERTY

1. Take over and maintain the site, after order to start work.
2. Until the work of the Contract is completed and accepted, the Contractor shall be responsible for the safety of the adjoining property, including sidewalks, paving, fences, sewers, water, gas, electric and other mains, pipes and conduits etc. The Contractor shall, at its own expense, except as otherwise specified, protect same and maintain them in least as good a condition as that in which the Contractor finds them.
3. All pavements, sidewalks, roads and approaches to fire hydrants shall be kept clear at all times, maintained and repaired to serviceable condition with materials to match existing.
4. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.
5. The Contractor shall also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

N. SAFETY PRECAUTIONS FOR CONTROL CIRCUITS

1. Control circuits, the failure of which will cause a hazard to life and property, shall comply with the New York City Dept. of Buildings, Bureau of Electrical Control requirements.

O. OBSTRUCTIONS IN DRAINAGE LINES

1. The Contractor shall be responsible for all obstructions occurring in all drainage lines, fittings and fixtures after the installations and cleaning of these drainage lines, fittings and fixtures as certified by the Resident Engineer. Roof drains shall be kept clear of any and all debris. Any stoppage shall be repaired immediately at the expense of the Contractor for General Construction Work.

P. MAINTENANCE OF PROJECT SITE

1. Take over and maintain all project areas, after order to start work.
2. Until the work of the Contract is completed and accepted, the Contractor shall be responsible for the safety of all project areas, including water, gas, electric and other mains and pipes and conduits and shall at the Contractor's own expense, except as otherwise specified, protect same and maintain them in at least as good condition as that in which the Contractor finds them.
3. All pavements, sidewalks, roads and approaches to fire hydrants shall be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.
4. The Contractor shall keep the space for the Resident Engineer in a clean condition.

Q. PROJECT SIGN AND RENDERING
PART A – PROJECT SIGN

1. **Responsibility:** The Contractor shall produce and install one (1) project sign which shall be posted and maintained upon the site of the project at a point and in a position where directed by the Commissioner. The Contractor shall protect the sign from damage during the continuance of work under the Contract and shall do all patching of lettering, painting and bracing thereof necessary to maintain same in first class condition and in proper position. Prior to fabrication, contractor shall submit an 8-1/2" x 11" color match print proof from the sign manufacturer of completed sign for approval by the Commissioner.
2. **Sign Quality:** The Contractor shall provide all materials required for the production of the sign as specified herein. Workmanship shall be of the best quality, free from defects and shall be produced in a timely manner.
3. **Schedule:** Upon project mobilization, the Contractor shall commence production and installation of the sign.
4. **Removal:** At the completion of all work under the Contract, the Contractor shall remove and dispose of the project sign away from the site.
5. **Sign construction:**
 - a. **Frame:** The frame shall be from quality dressed 2"x2" pine, fire retardant, pressure treated lumber, that surrounds the inside back edge of the sign. The sign shall have one (1) intermediate vertical and two (2) diagonal supports, glued and screwed for rigidity. Frame shall be painted white with two (2) coats of exterior enamel paint, prior to mounting of sign panel.
 - b. **Edging:** U-shaped, 22 gauge aluminum edging, with a white enameled finish to match sign background, shall run around entire edging of sign panel and frame. Corners shall be mitered for a tight fit. Channel dimensions shall be 1" inch (overlap to sign panel face) x 1 3/4" (or as required across frame depth) x 1" (back overlap).
 - c. **Sign Panel:** 4' x 8' panel shall be constructed in one (1) piece of 14 gauge (.0785") 6061-T6 aluminum. This panel shall be prefinished both sides with a glossy white baked-on enamel finish and be flush with edge of 2" x 2" wood frame. Samples must be submitted for approval.
 - d. **Fastening:** Fasten sign panel to wood frame using cadmium plated no. 8 sheet metal screws at 1/2" below edge of panel and 8" on center. The U-shaped aluminum channel shall be applied over the wood frame edge and fastened with cadmium plated no. 8 sheet metal screws at 12" on center around the entire perimeter.
6. **Sign Graphics:**
 - a. All visual components of the sign are in an Adobe *.pdf file, which is provided by the

Commissioner's representative. The file is to be opened in Acrobat Professional or Acrobat Approval in order to be saved with project information. The Commissioner's representative shall insert the project name and names and titles of personnel (3 or more) and any other required information associated with the project. At no point in the update, saving or renaming of the file should it be locked by any user. The digital file shall be provided by DDC to the Contractor (on a CD or via E-mail) for printing.

- b. The DDC *.pdf file with names provided by the commissioner shall be reproduced at the Sign Panel size of 4' x 8' on 3M High Performance Vinyl or approved equal. The sign manufacturer is required to print from the Acrobat *.pdf provided, and must match the following colors specified by Pantone: 3025 C, 119 C, 131 C, 1805 C, 1817 C in their exact locations as indicated in the *.pdf file, and on the DDC website: www.nyc.gov/buildnyc.
- c. Color shall be created in a four-color process to reproduce Pantone Colors (per Pantone formula).
 1. Pantone color 3025 C (C-100, M-17, Y-0, K-51).
 2. Pantone color 119 C (C-0, M-12, Y-100, K-49).
 3. Pantone color 131 C (C-0, M-32, Y-100, K-23).
 4. Pantone color 1805 C (C-0, M-91, Y-100, K-23).
 5. Pantone color 1817 C (C-0, M-90, Y-100, K-66).

The typeface, Helvetica shall be used in all text-fields as is specified in the settings of the Acrobat *.pdf.

Note: 3M High Performance Vinyl or equivalent shall be guaranteed for nine (9) years. Guarantee must cover fading, peeling, chipping or cracking.

PART B – PROJECT RENDERING (REFER TO THE ADDENDUM TO THE GENERAL CONDITIONS FOR THE APPLICABILITY OF THIS ARTICLE)

1. **Responsibility:** In addition to the Project Sign, the Contractor shall furnish and install one (1) sign showing a rendering of the project. From an approved image file provided by the DDC, the Project Rendering is to be sized, printed, and mounted in an identical manner as described in Part A above for the Project Sign. Any area of the 4' X 8' panel area not filled by the rendering shall be printed in Pantone color 3025 (c-100, M-17, y-0, K-51). A color match print proof from the sign manufacturer of the Rendering Sign printed from the supplied file is to be submitted to DDC for approval before fabrication. The Rendering Sign is to be posted at the same height as the Project Sign. Where possible, the Rendering Sign shall be mounted with a perfect match of the short sides of the rectangle so that the Rendering Sign and the Project Sign together will create one long rectangle.
2. **Removal:** At the completion of all work under the Contract, the Contractor shall remove and dispose of the project rendering away from the site.

R. PLANT PEST CONTROL REQUIREMENTS and TREE PROTECTION REQUIREMENTS

1. **Plant Pest Control Requirements:** The Contractor for General Construction Work (the "Contractor") and its subcontractors, including the Certified Arborist described below, shall comply with all Federal and New York State laws and regulations concerning Asian Longhorned Beetle (ALB) management, including protocols for ALB eradication and containment promulgated by the New York State Department of Agriculture and Markets (NYSDAM). The Contractor is referred to: (1) Part 139 of Title 1 NYCRR, Agriculture and Markets Law, Sections 18, 164 and 167, as amended, and (2) State Administrative Procedure Act, Section 202, as amended.

- a. All tree work performed within the quarantine areas must be performed by New York State Department of Agriculture and Markets (NYSDAM) certified entities. Transportation of all host material, living, dead, cut or fallen, inclusive of nursery stock, logs, green lumber, stumps, roots, branches and debris of a half inch or more in diameter from the quarantine areas is prohibited unless the Contractor or its sub contractor performing tree work has entered into a compliance agreement with NYSDAM. The terms of said compliance agreement shall be strictly complied with. Any host material so removed shall be delivered to a facility approved by NYSDAM. For the purpose of this contract host material shall be ALL species of trees.
 - b. Any host material that is infested with the Asian Longhorned Beetle must be immediately reported to NYSDAM for inspection and subsequent removal by either State or City contracts, at no cost to the Contractor.
 - c. Prior to commencement of tree work, the Contractor shall submit to the Commissioner a copy of a valid Asian Longhorned Beetle compliance agreement entered into with NYSDAM and the Contractor or its sub contractor performing tree work. If any host material is transported from the quarantine area the Contractor shall immediately provide the Commissioner with a copy of the New York State 'Statement of Origin and Disposition' and a copy of the receipt issued by the NYSDAM approved facility to which the host materials are transported.
 - d. Quarantine areas, for the purpose of this contract shall be defined as all five boroughs of the City of New York. In addition, prior to the start of any tree work, the Contractor shall contact the NYC Department of Parks & Recreation's Director of Landscape Management at (718) 699-6724, to determine the limits of any additional quarantine areas that may be in effect at the time when tree work is to be performed. The quarantine area may be expanded by Federal and State authorities at any time and the Contractor is required to abide by any revisions to the quarantine legislation while working on this contract. For further information please contact NYSDAM (631) 288-1751.
2. **Tree Protection Requirements:** The Contractor shall retain a Certified Arborist, as defined by New York City Department of Parks and Recreation (NYCDPR) regulations, to provide the services described below.
- a. **Surveys and Reports:** The Certified Arborist shall, at the times indicated below, conduct a survey and prepare a plant material assessment report which includes: (1) identification, by species and pertinent measurements, of all plant material located on the project site, or in proximity to the project site, as described below, including all trees, significant shrubs and/or planting masses; (2) identification and plan for the containment of plant pests and pathogens, including the ALB, as described above; (3) evaluation of the general health and condition of any infected plant material.
 - b. **Frequency of Reports:** The Certified Arborist shall conduct a survey and provide a plant material assessment report at two (2) points in time: (1) prior to the commencement of construction work; and (2) at the time of substantial completion. In addition, for projects exceeding 24 months in duration, the Certified Arborist shall conduct a survey and prepare a report at the midpoint of construction. Copies of each plant material assessment report shall be submitted to the Resident Engineer within two (2) weeks of the survey.
 - c. **Proximity to Project Site:** Off-site trees, significant shrubs and/or planting masses shall be considered to be located in proximity to the project site under the circumstances described below.
 1. The tree trunk, significant shrub, or primary cluster of stems in a planting mass is within 50 (fifty) feet of the project's Contract Limit Lines (CLLs) or Property Lines (PLs).
 2. Any part of the tree or shrub stands within 50 (fifty) feet of: (a) a path for site access for vehicles and/or construction equipment; or (b) scaffolding to be erected for construction

activity, including façade remediation projects.

3. The Certified Arborist determines that the critical root zone (CRZ) of an off-site tree, significant shrub, or primary cluster of stems in a planting mass extends into the project site, whether or not that plant material is located within the 50-foot inclusionary perimeter as outlined above.

- d. Tree Protection Plan: The Certified Arborist shall prepare, and the Contractor shall implement, a Tree Protection Plan, for all trees that may be affected by any construction work, excavation or demolition activities, including without limitation, (1) on-site trees, (2) street trees, as defined below, (3) trees under NYCDPR jurisdiction as determined by the Department of Transportation, and (4) all trees that are located in proximity to the project site, as defined above. The Tree Protection Plan shall comply with the NYC DPR rules, regulations and specifications. The Contractor is referred to Chapter 5 of Title 56 of the Official Compilation of the Rules of the City of New York. Copies of the Tree Protection Plan shall be submitted to the Resident Engineer prior to the commencement of construction. Implementation of the Tree Protection Plan for street trees and trees under NYCDPR jurisdiction shall be in addition to any tree protection requirements specified or required for the project site.

For the purpose of this article, a "street tree" means the following: (1) a tree that stands in a sidewalk, whether paved or unpaved, between the curb lines or lateral lines of a roadway and the adjacent property lines of the project site, or (2) a tree that stands in a sidewalk and is located within 50 feet of the intersection of the project's site's property line with the street frontage property line.

3. No Separate Payment. No separate payment shall be made for compliance with Plant Pest Control Requirements or Tree Protection Requirements. The cost of compliance with Plant Pest Control Requirements and Tree Protection Requirements shall be deemed included in the Contractor's bid for the Project.

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**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF BUILDINGS**

30-30 THOMSON AVENUE
TELEPHONE (718) 391-1000

LONG ISLAND CITY, NEW YORK 11101-3045
WEBSITE www.nyc.gov/buildnyc

Contract for Furnishing all Labor and Material Necessary

Contractor

Dated _____, 20____

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

Dated _____, 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20____



FMS ID: F175QUEEN



**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

NEW EMS STATION 50

LOCATION: 159-10 Goethals Avenue
BOROUGH: Queens 11432
CITY OF NEW YORK

Calcedo Construction Corporation
Contractor

Dated October 24th, 20 13

Approved as to Form
Certified as to Legal Authority

[Signature]
Acting Corporation Counsel

K.T. 5/9/13

Dated May 9, 20 13

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20 _____





PROJECT ID:

F175QUEEN

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/buildnyc

VOLUME 3 OF 3

**ADDENDUM TO THE GENERAL
CONDITIONS**

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

NEW EMS STATION 50

LOCATION:
BOROUGH:
CITY OF NEW YORK

159-10 Goethals Avenue
Queens 11432

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

FDNY

Dean/Wolf Architects

Date:

April 25, 2013



3-050

ADDENDA CONTROL SHEET

TITLE: NEW QUEENS EMS STATION 50

[illegible]

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

July 1, 2013

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

F175QUEEN
NEW QUEENS EMS STATION 50

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **The Bid Opening for the contract described below scheduled for July 9 , 2013, at 2:00 pm is rescheduled to July 17, at 2:00 pm.**

Contract #1 – General Construction Work

2. **Questions from Bidders and Responses to Questions:**

See Attachment A.

4. **Revisions to Specifications**

See Attachment B.

5. **Revisions to Drawings:**

See Attachment C.

6. **Revisions to Bid Booklet:**

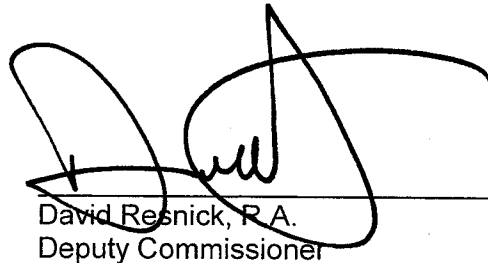
See Attachment D.

7. **Revisions to Volume 2:**

See Attachment E.

THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-2200, (718) 391-1727, or by fax at (718) 391-2615.



David Resnick, P.A.
Deputy Commissioner

Name of Bidder

By: _____

DDC PROJECT #: F175 QUEEN

PROJECT NAME: EMS Station 50

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	On Drawing L-0, "Reinforced concrete ramp" with marker 6/L-4 is shown as asphalt pavement on L-4. Please clarify.	Ramp is 14" reinforced concrete framed slab. See S-2 for extent. Slab transitions to asphalt at Grid Line B See detail#13/S-16.
2	Concrete driveway in detail 2/L-4 shows 9" concrete but in the Legend it is only 7". Please clarify.	Driveway is 9" as per detail 2/ L-4. See Attachment C, Revisions to Drawings.
3	There is no detail 13/L-5 that can be found from fence detail 6/L-5. Please confirm if the fence for the parking lot is a different type of fence on the retaining wall.	Key-in should be labeled 13/ L-4. Fence on retaining wall is a trellis and is different than perimeter fence. See Attachment C, Revisions to Drawings.
4	On Drawing L-0, please confirm that the underground fuel storage tank and related two manholes are not in this contract, (refer to Drawing S-1 where it states "below grade fuel tank and enclosure by others")	Fuel tank and manholes are part of overall contract. See "F" series drawings and Division 43 specifications. See Attachment C, Revisions to Drawings.
5	Is there an Alternate to this Bid? There is an Alternate to Brush Module in Note 1 of the Plant Schedule on Drawing L-0. Please advise.	This note is deleted. See Attachment C, Revisions to Drawings.
6	Provide elevations or schedule for H1 hanger supports as shown on Drawings S-6, S-7, S-10 and S-11	See Detail 4/6-.0 for elevations.
7	Provide elevations schedule for H2 Hanger support as shown on Drawing S-5.	Assume a nominal length of 8". See drawing 2/A-4.3.
8	Provide elevations schedule for P1 post as shown on Drawing S-6 thru S-8.	P-1 hangers have a length of 2'-0". See drawing 1/A5.0 for typical condition.
9	Provide specification #084113 for Aluminum and Glass entrance doors.	See Attachment B, Revisions to Specifications
10	Exhaust Fan EF-7 as indicated on Drawing. E-0 & H-0 basement floor plan is not shown on the exhaust fan schedule H-9. Please advise.	Fan EF-7 is deleted from the project. Remaining tag on H-0 and wiring on E-0 are deleted and are not considered to be part of project. See Attachment C, Revisions to Drawings.

No.	Bidders Questions	DDC Responses
11	Exhaust Fan EF-8 is shown on Drawing. H-6 roof plan west but is not shown on the exhaust fan schedule H-9. There is also no specification for the fan on exhaust Drawing as indicated on H-6. Please advise.	Exhaust Fan EF-8 is shown in the schedule on drawing VE-2. Fan specifications are provided in Section 233516.
12	Please provide framed slab schedule for foundation and cellar plan S-0 & S-1	Framed slabs are not shown on S-0 & S-1 Foundation Drawings. They are called out on S-2 and S-3.
13	Please provide specification for the type of elastomeric formliner (prices range from \$14 per square foot to \$75 per square foot).	See Section 033300 pages 6&7 which includes information on the custom pattern and panel size.
14	Please clarify which steel requires intumescent paint i.e. Does the AESS steel require it prior to painting?	All AESS to be painted with intumescent paint. Finish protective top coat is final coat. No further painting is needed.
15	Please confirm if we would be able to set the preset steel from the parking lot that is being shown on the drawings?	Only a portion of the existing Parking Lot will be accessible to the project. Staging Plans must be approved before implementation.
16	Does the Bid Breakdown form have to filled out and submitted with the bid or can it be submitted at a later date?	Instructions for the Bid Breakdown form are on pages 2 and 21 of the Bid Booklet.
17	Please clarify the intent for Section 120640 and related schedules on A7.1 and A7.2.	See Section 120640 Pages 2 & 3 for additional information.
18	The Door Schedule shown on Drawing A9.1 lists Hardware Sets that do not match the Hardware Sets as shown in the specification Section 87100-Finish hardware. Please advise if we should follow the Door Hardware Schedule provided in the specifications or the Door Hardware sets listed on the Door Schedule within the drawings?	See Attachment B, Revisions to Specifications for revised section 087100.
19	On the Door Hardware Schedule in section 087100, some of the items are blacked out or highlighted in a color that didn't come thru when copied. Please clarify if these items are to be deleted? If not, please provide legible copy of these sets.	See Attachment B, Revisions to Specifications for revised section 087100.

No.	Bidders Questions	DDC Responses
20	Details 14, 16, & 17/A9.1 show a fire rated assembly as manufactured by Technical Glass Products and others. Is there a specification available for these products? Which of the doors are to be included as a fire rated assembly. Please advise.	See Attachment B, Revisions to Specifications for new section 084900 and Door Schedule on Drawing A-9.1 for door rating types.
21	On Drawings A-7.1 and A-7.2 , the Finish Schedule for the First and Second Floor can be found. Is there a Finish Schedule for the Basement Level? Please advise.	There is no finish schedule for the basement. Assume exposed concrete/CMU floors, walls and ceilings.
22	Drawing D-0 appears to have two drawings overlaying each other. One drawing is upside down. Is this the correct orientation the drawing should be viewed? Please advise	Drawing has two files that are overlaying each other. The orientation is acceptable: the demolition notations at the periphery are the scope of work.
23	Drawing D-0 indicates to relocate existing parking lifts. a) Where are they getting relocated to? b) Are they currently under warranty by a company? c) What is the size of the lift? d) Who is the manufacturer? e) Does the Hospital want us to use their current contractor? f) What type of system is it?	The car lifts indicated on the drawings have been removed from the site. Note is deleted. See Attachment C, Revisions to Drawings.
24	In Drawing A-9.3, Wall Type 5- Chase Wall, there seems to be a Stud & Layer of Insulation missing? Please Clarify.	There is a stud and a layer of missing insulation. See Attachment C, Revisions to Drawings for correct drawing attached.
25	In Drawing A-8.3 in Section 10, 14, 18 & 22. What is the finish on the wall below Black Painted Glass?	Painted Gypsum Wall Board (GWB).
26	In the Reflected Ceiling Plan drawings A-2.0, 2.1, 2.2 & 2.3. Is fireproofing ONLY in Rm 102, SE Entry & 110 EMS Station Office High Ceiling?	Yes fireproofing is only in the aforementioned rooms.
27	In Drawing A-8.3, Interior Glazing Schedule, Unit numbers 4-9 are on the same wall, but each window unit has more layers than the previous. Can this please be clarified?	Reference drawing A9.9: all glass for units 4-9 should be clear ½" tempered low-iron glass.

28	Volume 2 of 3 of the contract specifications for the above referenced project does not contain the text of the project specific Project Labor Agreement, The spec book contains a memo dated March 20, 2013 to the Commissioner recommending the job specific PLA however the actual agreement was not included. Please provide a copy of this document by pre bid addendum.	A copy of the Project Labor Agreement is included with this addendum. The fully executed PLA agreement is expected to be available prior to the award of contract.
29	The Construction Drawings provided via hard copy including the DDC servers are incorrectly scaled. The Bidding Contractor respectfully requests scaled drawings to prepare and accurate estimate.	DDC has made available properly scaled drawings for pick up and via its Webpage.
30	Section 011100, Summary of Work paragraph 1.2 2c & d as well as Section 026100 Removal and Disposal of Contaminated Soils paragraph 1.1 D refer to a unit price in the Bid Form for disposal of contaminated soils outside the limits of excavation. The Bid Sheer does not have a place to insert this unit price.	These requirements are excluded from the contract. See Attachment B, Revisions to Specifications.
31	The description of Type L13 says pole 14'- 3LT T8. Please clarify.	Type L13 fixture has (3) T8 lamps. Attachment B, Revisions to Specifications for additional information.

DDC PROJECT #: F175 QUEEN

PROJECT NAME: EMS Station 50

ATTACHMENT B – REVISIONS TO THE SPECIFICATIONS

Specification Section 011100, Summary of Work

Paragraph 1.2 2c & d are deleted.

Specification Section 026100, Removal and Disposal of Contaminated Soils

Paragraph 1.1 D is deleted.

Specification Section 112600 Unit Kitchens

Delete entire section from booklet. Refer to details in sheet A-9.8 for millwork in Training Kitchen Rm 214.

Specification Section 113100 Appliances

Part 2.1 D: Remove Dishwasher and replace with Ice Machine: Revit by Scotsman: Model No. CU50 GA-1 KKPK or approved equal.

Specification Section 263213 Power Generator

Part 2 Products 2.1 Remove "Generac" from list of acceptable manufacturers and replace with "Detroit Diesel"

The following specification sections have been included with this addendum as part of the Contract Documents

Specification Section 084313 Aluminum Entrance & Storefronts

Specification Section 084900 Fire Rated Glass & Framing System

Specification Section 087100 Finish Hardware- Clarifications

Specification Section 099646 Intumescent Coatings

Specification Section 109000 Miscellaneous Specialties

SECTION 084313

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the aluminum entrances and storefronts as indicated on the drawings and/or specified herein including the following:
 - 1. Exterior entrance systems.
 - 2. Exterior storefront systems.

1.3 RELATED SECTIONS

- A. Sealants - Section 079200.
- B. Aluminum windows - Section 085113.
- C. Finish hardware - Section 087100.
- D. Glass and glazing - Section 088000.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.
- B. Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of work. Provide plans, elevations, and details of anchorages, connections and accessory items. Provide installation templates for work installed by others. Show interfaces and relationships to work of other trades.
- C. Field Measurements: Take necessary field measurements before preparation of shop drawings and fabrication. Do not delay progress of job. If field measurements are not possible prior to fabrication, allow for field cutting and fitting.
- D. Initial Selection Samples: Submit samples showing complete range of colors, textures, and finishes available for each material used.

- E. Verification Samples: Submit representative samples of each material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide samples having minimum size of 144 sq. in.
- F. Calculations: Provide professionally prepared calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied; refer to Article 1.5, para. D for further description.
- G. Test Reports: Provide certified test reports for specified tests.

1.5 QUALITY ASSURANCE

- A. Source: For each material type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- B. Installer: A firm with a minimum of three years experience in type of work required by this Section and which is acceptable to manufacturers of primary materials.
- C. Design Criteria: Drawings indicate sizes, member spacings, profiles, and dimensional requirements of work of this Section. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in the Architect's sole judgment, such deviations do not materially detract from the design concept or intended performances.
- D. Engineering: Provide services of a Professional Engineer, registered in the jurisdiction in which the Project will be built, to design and certify that work of this Section meets or exceeds performance requirements specified.

1.6 TESTS AND PERFORMANCE REQUIREMENTS

- A. Manufacturer's Standard Tests: Provide manufacturer's standard test data showing compliance with specified requirements.
- B. Testing and performance data applies to exterior assemblies.
- C. Test Sequence: Test sequence is optional, except that air infiltration tests shall precede water resistance tests.
- D. Air Infiltration Test: Test unit in accordance with ASTM E 283, as follows:
 - 1. Static Air Pressure Difference: 6.24 psf for fixed storefront units, and 1.567 psf for doors.
 - 2. Performance: Maximum air leakage shall not exceed the following:
 - a. Fixed Storefront Units: 0.06 cfm per sq. ft. of window area.
 - b. Door Units: 0.50 cfm per sq. ft. of single doors, 1.00 cfm per sq. ft. for doors hinged in pairs.

- E. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.
 - 1. Test Pressure: 6.24 psf.
 - 2. Performance: No leakage as defined in test method at specified test pressure.
 - F. Uniform Load Deflection Test: Test units in accordance with ASTM E 330, at following static air pressure difference (Design Wind Pressure), or loads prescribed by code for this project site, whichever is greater. Apply pressure first to exterior side (positive) and then interior side (negative).
 - 1. Design Wind Pressure: 30 pounds per square foot minimum.
 - 2. Test Procedure: Procedure A as specified in ASTM E 330.
 - 3. Performance: Deflection in each member measured at locations of greatest deflection shall not exceed $L/175$ at specified Design Wind Pressure.
 - G. Uniform Load Structural Test: Test units in accordance with ASTM E 330 at following static air pressure difference. Apply high pressure load first on one side and then on other side. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or activating mechanisms.
 - 1. Static Air Pressure: Minimum 1.5 times the Design Wind Pressure.
 - 2. Permanent Deformation in Any Member: Not to exceed 0.2% of member span.
 - H. Condensation Resistant Factor: Not less than 45 for fixed storefront units, and not less than 48 for doors; per AAMA 1502.7.
 - I. Thermal Movement: Provide storefront systems that allow for expansion and contraction of members throughout an ambient temperature range of 120°F.
 - J. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures", Section 9, "Earthquake Loads", whichever are more stringent.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Store under cover and protect from weather damage.
 - B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.8 WARRANTIES

- A. Provide written warranty, signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship. "Defects" is defined to include, but not limited to, leakage of water, abnormal aging or deterioration, abnormal deterioration or fading of finishes, and failure to perform as required. Include requirement for removal and replacement of covering and connected adjacent work.
 - 1. Warranty Period: Three (3) years from date of Substantial Completion; except finish shall be warranted for a period of fifteen (15) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/PRODUCTS

- A. Provide storefronts and entrance systems of one of the following manufacturers that meet or exceed requirements of these specifications:
 - 1. Kawneer Company, Inc.
 - 2. Wausau Metals Corporation.
 - 3. EFCO.
 - 4. Vistawall.
- B. Products:
 - 1. Exterior frame system shall be equal to Series 451T, manufactured by Kawneer Company, Inc.; or approved equal manufacturer listed above.
 - 2. Doors application shall be "Medium Stile 350" manufactured by the Kawneer Co. Inc. or approved equal manufacturer listed above.

2.2 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Provide 6063-T5 alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish. Comply with ASTM B 221 for extrusions, and ASTM B 209 for sheet/plate. Provide 0.125 in. thick extrusions for door stiles and storefront framing. Provide 0.050 in. thick aluminum for glazing moldings.
 - 1. Structural aluminum shapes shall conform to ASTM B 308.
- B. Fasteners: Provide non-magnetic stainless steel fasteners, warranted by manufacturer to be non-corrosive and compatible with aluminum components.
- C. Concealed Flashing: Dead-soft stainless steel, 26 gage minimum, or extruded aluminum 0.062 in. minimum, of an alloy and type selected by manufacturer for compatibility with other components.

- D. Brackets and Reinforcements: Non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.
- E. Concrete/Masonry Inserts: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- F. Bituminous Coatings: Cold-applied asphalt mastic compounded for 30-mil thickness per coat.
- G. Compression Weatherstripping: Manufacturer's standard replaceable stripping of molded neoprene or PVC gaskets complying with ASTM D 2287.
- H. Sliding Weatherstripping: Manufacturer's standard replaceable stripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing.

2.3 HARDWARE

- A. Provide hardware units as indicated, scheduled, or required for operation of each door. Refer to Section 087100, Finish Hardware for hardware description.

2.4 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, including profile requirements, are indicated on Drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
- B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.
 - 1. Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.
 - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
 - 3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in manner which prevents damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.
- C. Welding: Comply with recommendations of American Welding Society to avoid discoloration; grind exposed welds smooth and restore mechanical finish.
- D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator to prevent corrosion.
- E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.

- F. Fasteners: Conceal fasteners.
- G. Provide EPDM/vinyl blade gasket weatherstripping in bottom exterior door rail, adjustable for contact with threshold.
- H. Provisions shall be made in the framing for minimum edge clearance, nominal edge cover, and nominal pocket width for the thickness and type of glazing installed, and shall be in accordance with the FGMA Glazing Manual.
- I. Pocket glazed framing shall provide:

	<u>Single Glass</u>	<u>Ins. Glass</u>
1. Nominal edge cover (or bite) framing only	5/16"	1/2"
2. Min. nominal edge clearance	1/8"	1/4"
3. Min. face clearance	1/8"	5/32"

2.5 STOREFRONT FRAMING

- A. General: Provide inside-outside matched resilient flush glazed system with provisions for glass replacement. Shop fabricate and preassemble frame components where possible.
- B. Thermal-Break Construction: Fabricate exterior aluminum storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members, in manner which eliminates direct metal-to-metal contact. Provide manufacturer's standard construction which has been in use for similar projects for at least three years.
- C. For glass and glazing, refer to Section 088000.

2.6 ALUMINUM DOORS

- A. Aluminum entrance doors shall be medium stile factory-glazed aluminum doors, manufactured by same manufacturer as storefront framing.
- B. Aluminum entrance doors shall be stile and rail type swing doors. Aluminum shall be extruded aluminum conforming to ASTM B 221, 0.125 in. thick for door stiles and 0.050 in. thick for glazing molding.
 - 1. Sections shall be of sizes and profiles indicated; shall present straight, sharply defined lines and arrises; and shall be free from defects impairing strength, durability, and appearance.
 - 2. Fasteners where exposed shall be aluminum stainless steel or plated steel conforming to ASTM A 164.
- C. Each door shall be factory glazed set in neoprene glazing gasket, refer to Section 088000 for glass.

- D. Doors shall meet the following resistance to corner racking when tested by the Dual Moment Load Test.
 - 1. Test section shall consist of a standard top door corner assembly. Side rail section shall be 24" long and top rail section shall be 12" long.
 - 2. Anchor "top rail" positively to test bench so that corner protrudes 3" beyond bench edge.
 - 3. Anchor a lever arm positively to "side rail" at a point 19" from inside edge of "top rail". Attach weight support pad at a point 19" from inner edge of "side rail".
 - 4. Test section shall withstand a load of 235 lbs. On the lever arm before reaching the point of failure, which shall be considered a rotation of the lever arm in excess of 45 deg.
- E. Air Infiltration: (Applies only to single acting offset pivot or butt hung entrances).
 - 1. Air infiltration shall be tested in accordance with ASTM E 283, at a pressure differential of 1.567 psf. A single 3'-0" x 7'-0" entrance door and frame shall not exceed .50 cfm per linear foot of perimeter crack. A pair of 6'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 cfm per linear foot of perimeter crack.
- F. For door hardware, refer to Section 087100.
- G. Door bottom rail of exterior doors shall have an EPDM blade gasket sweep strip applied with concealed fasteners.
- H. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be hook-in type with EPDM glazing gaskets.
- I. The door weatherstripping on a single acting offset pivot or butt hung exterior door and frame (single or pairs) shall be thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
- J. The door weatherstripping on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. The door bottom rail shall be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners.
- K. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.

2.7 FINISH

- A. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat,

and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605-98.
2. Custom color and glass as selected by the Architect.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where aluminum entrances and storefronts are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install aluminum entrance doors and storefront framing in openings prepared under other Sections plumb, square, level, in exact alignment with surrounding work, with proper clearances, and securely and positively anchored to building structure, to meet performance requirements specified herein, in accordance with manufacturer's published instructions and approved submittals.
- B. Use only skilled mechanics for erection, under supervision of manufacturer's representative.
- C. Provide protection against galvanic action. Isolate dissimilar materials with bituminous coating or non-absorptive dielectric tape.
- D. Install aluminum entrance doors, storefront frame, and finish hardware. Carefully fit and adjust doors and hardware to frames and weatherstripping. After erection check and adjust operating hardware for smooth and proper operation.
- E. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 079200.
- F. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances.
 1. Variation from Plane: Limit variation from plane or location shown to 1/8" in 12'; 1/4" over total length.
 2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16". Where surfaces meet at corners, limit offset from true alignment to 1/32".

3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8".

3.3 PROTECTION AND CLEANING OF ALUMINUM

- A. Protect finished metal surfaces from damage during fabrication, shipping, storage, and erection, and from then until acceptance by Owner.
- B. Clean metal surfaces promptly after installation, exercising care to avoid damage. Remove excess sealant, dirt, and other substances. Lubricate hardware and other moving parts.

3.4 PROTECTION AND CLEANING OF GLASS

- A. Replace glass that is broken, cracked or chipped prior to time of final acceptance of Project by Owner.
- B. Clean glass surfaces promptly after installation, exercising care to avoid damage to same.

END OF SECTION

SECTION 084900

FIRE RATED GLASS AND FRAMING SYSTEM

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the fire rated door and framing systems as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Hollow metal work - Section 08113.
- B. Finish hardware- Section 087100.
- C. Glass and glazing - Section 088000.

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
 - 2. ASTM E152: Methods for Fire Tests of Door Assemblies.
 - 3. ASTM E163: Methods for Fire Tests of Window Assemblies.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 80: Fire Doors and Windows.
 - 2. NFPA 251: Fire Tests of Building Construction & Materials
 - 3. NFPA 252: Fire Tests of Door Assemblies
 - 4. NFPA 257: Fire Test of Window Assemblies
- C. Underwriters Laboratories, Inc. (UL):
 - 1. UL 9: Fire Tests of Window Assemblies
 - 2. UL 10 B: Fire Tests of Door Assemblies
 - 3. UL 263: Fire Tests of Building Construction and Materials

4. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies

D. American National Standards Institute (ANSI):

1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

E. Consumer Product Safety Commission (CPSC):

1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials

1.5 SYSTEM DESCRIPTION

A. Performance Requirements

1. Duration of Fire Rating - System: Capable of providing a fire rating for 120 minutes, unless otherwise indicated.
2. Fire Resistive Rating: Glaze applications in occupancy or area separation walls where glazing exceeds 25% of the wall area, or as otherwise specified with a fire resistive assembly meeting the radiant heat requirements of ASTM E119. Per ASTM E119 and UL 263 requirements temperature on the non-fire side of glazing and framing at conclusion of fire test exposure shall be below 250°F above ambient room temperature.

1.6 SUBMITTALS

- A. Shop Drawings: Show doors, frames, hardware and steel frame components as shown on shop drawings and schedules.
 1. Obtain Architect's approval before fabrication.
- B. Samples: Submit in the form of 12-inch square samples for glass and of 12-inch long samples for framing and sealants. Install sealant samples between two strips of material representative in color of the adjoining framing system.
- C. Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Provide signed and sealed calculations and shop drawings by a Professional Engineer licensed in the State of New York demonstrating that partitions comply with lateral load criteria of 5 psf and a maximum L/360 deflection; unless greater load required by Code.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed work similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.
- B. Fire-Rated Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 and 257.
- C. Certification - Fire-Rated Assemblies: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 - 1. An approved independent testing laboratory equal to UL shall conduct fire test.
- D. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer. For details on storage and product handling, please contact Technical Glass Products and request information on storage and product handling.
- B. Deliver materials to specified destination in manufacturer or distributor's packaging undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.

1.9 WARRANTY

- A. Provide system supplier's limited five year warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer Fire Rated Glass Material: "Pyrostop" fire rated glazing as fabricated and distributed by Technical Glass Products, Kirkland, WA 98033 (800-426-0279).
- B. Interior Frame System: "Fireframes® Curtainwall Series" with "Heat Barrier Series" doors by TGP fire rated steel frame system as manufactured supplied by Technical Glass Products, Kirkland, WA 98033 (800-426-0279).

2.2 MATERIALS – GLASS,

- A. Fire Rated Glazing: Fire rated and safety rated glass, and 1-1/2 hour, shall be Fire-Lite Plus, manufactured by Technical Glass Products. Glass shall comply with ANSI Z97.1 Category I and II.
- B. Thickness: 1-9/16".

2.3 MATERIALS - STEEL FRAMING

- A. Steel Framing System: In addition to manufacturer's 120 min. interior framing system specified.
 - 1. Steel Frame: Profiled steel tubing permanently joined with steel bolts.
 - 2. Insulation: Insulate framing system against effects of fire, smoke, and heat transfer from either side. Insulate profiled steel tubing using a shell construction that incorporates Promatect-H intermediate interlayer. Firmly pack perimeter of framing system to rough opening with mineral wool fire stop insulation or appropriately rated intumescent sealant.
 - 3. Steel Glazing Beads: Extruded steel beads with dimensions recommended by manufacturer to securely hold glazing material in place.
 - 4. Fasteners: Type recommended by manufacturer
 - 5. Glazing Accessories: Line glazing pockets with intumescent tape supplied by frame manufacturer. Set glass using hardwood, calcium silicate, or neoprene setting blocks.
 - 6. Glazing Compounds: Glaze glass with approved vinyl supplied by manufacturer, closed cell PVC tape, or pure silicone sealant.

2.4 FABRICATION

- A. Furnish frame assemblies pre-welded when possible. Splice frames too large for shop fabrication or shipping. Fit with suitable fasteners.
- B. Field glaze door and frame assemblies.
- C. Factory prepare steel door assemblies for field mounting of hardware.
- D. Fabrication Dimensions: Fabricate fire rated assembly to approved dimensions. Guarantee dimensions where practicable within required tolerance.
- E. Obtain approved shop drawings prior to fabrication.

2.5 FINISHES

- A. Factory applied baked enamel finish in custom color as selected by the Architect.
- B. Finish frames after assembly.

PART 3 – EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.
- B. Provide openings plumb, square and within allowable tolerances.
- C. Notify Architect of any conditions which jeopardize the integrity of the proposed fire rated entrance system. Do not proceed until such conditions are corrected.

3.2 INSTALLATION

- A. Install systems by a specialty subcontractor with appropriate experience qualifications; and in strict accordance with the approved shop drawings. Employ experienced mechanics familiar with this type of specialized work.
- B. Install fire safing/firestopping at edges of system.
- C. Install glazing in strict accordance with respective glazing material manufacturer's specifications. Field cutting or tampering is not permissible.
- D. Install door hardware specified.

3.3 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- D. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

DOOR HARDWARE SCHEDULE

Queens Hospital EMS Station 50

FMS Project ID:

F175QUEEN

HARDWARE SET A	Doors 123, 125
Lock:	YALE 5400LN Series, YAAU5408LN-US26D CLASSROOM/OFFICE I/C REMOVABLE CORE, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Threshold:	National Guard Product Inc. model
Hinges:	Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.
HARDWARE SET B	Doors 001,002,003,004,005, 111,112,113,114,115, 122,127,128,129,131,201,203,204,205,209, 210, 214,215,216,217,218
Lock:	YALE 5400LN Series, YAAU5405LN-US26D STOREROOM I/C REMOVABLE CORE, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Hinges:	Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.
HARDWARE SET C	Doors 108,116, 117,118,119,120,121,206,207,208,211,213
Lock:	YALE 5400LN Series, YAAU5401LN-US26D PASSAGE, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Hinges:	Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.
HARDWARE SET D	Doors 130, 212
Lock:	YALE 5400LN Series, YAAU5402LN-US26D PRIVACY, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Hinges:	Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.
HARDWARE SET E	Door 101
Lock:	YALE 5400LN Series,YAAU5407LN-US26D ENTRANCE I/C REMOVABLE CORE, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Panic Hardware:	Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS) 30 Series exterior trim with DM-S Lever in 630 finish
Threshold:	National Guard Product Inc.approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Magnetic Door Position Switch (DPS):	Sentrol, 1076 series, off-white
HARDWARE SET F	Door 102
Lock:	KABA Ilco Model 1021B-26-d-41, with lever handles on both sides, satin chrome finish
Closer:	Jackson 20-330 Overhead Closer with HD spring size
Threshold:	National Guard Product Inc.approved for ADA compliance, Alum.
Hinges:	Center line pivot by Jackson to be compatible with Jackson 20-330 overhead closer.
HARDWARE SET G	Door 103
Lock:	YALE 5400LN Series,YAAU5407LN-US26D ENTRANCE I/C REMOVABLE CORE, Securex Electric Function Fail Secure with REX, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Threshold:	National Guard Product Inc.approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Magnetic Door Position Switch (DPS):	Sentrol, 1076 series, off-white
Motion Detector:	Optex model AX70TN

HARDWARE SET H**Doors 104, 107**

	YALE 5400LN Series, YAAU5407LN-US26D ENTRANCE I/C REMOVABLE CORE, Secutex Electric Function Fail Secure with REX, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Threshold:	National Guard Product Inc. approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Emergency Exit Switch (DPS):	Sentrol, 1076 series, off-white
Motion Detector:	Optex model AX70TN
Electric latch retraction exit device:	Dorma rim-mounted x ES x MS
Video Intercom:	AIPHONE JA-2MECD
Biometric Reader:	Vascular Reader VP-II X

HARDWARE SET I**Door 105**

	YALE 5400LN Series, YAAU5407LN-US26D ENTRANCE I/C REMOVABLE CORE, Secutex Electric Function, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Lock:	
Panic Hardware:	Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS) 30 Series exterior trim with DM-S Lever in 630 finish
Threshold:	National Guard Product Inc. approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Magnetic Door Position Switch (DPS):	Sentrol, 1076 series, off-white

HARDWARE SET J**Door 106**

	YALE 5400LN Series, YAAU5407LN-US26D ENTRANCE I/C REMOVABLE CORE, Secutex Electric Function Fail Secure with REX, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Lock:	
Panic Hardware:	Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS) 30 Series exterior trim with DM-S Lever in 630 finish
Threshold:	National Guard Product Inc. approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Magnetic Door Position Switch (DPS):	Sentrol, 1076 series, off-white
Motion Detector:	Optex model AX70TN, Tx Beam

HARDWARE SET K**Doors 109, 110, 124, 202**

Panic Hardware:	Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS) 30 Series exterior trim with S Lever in 630 finish
Closer:	National Guard Product Inc. approved for ADA compliance, Alum.
Threshold:	National Guard Product Inc. approved for ADA compliance
Hinges:	Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET L**Door 126 (ALS)**

	YALE 5400LN Series, YAAU5408LN-US26D CLASSROOM/OFFICE I/C REMOVABLE CORE, Secutex Electric Function Fail Secure with REX, AUGUSTA AU Lever, 626 Finish, 497 ANSI Strike
Lock:	
Panic Hardware:	Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS) 30 Series exterior trim with DM-S Lever in 630 finish
Threshold:	National Guard Product Inc. approved for ADA compliance, Alum.
Power Transfer Hinge:	4-wire type or Von Duprin EPT
Closer:	Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish
Magnetic Door Position Switch (DPS):	Sentrol, 1076 series, off-white
Biometric Reader:	Vascular Reader VP-II X

SECTION 099646

INTUMESCENT COATINGS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the intumescent fireproofing on fireproofed steel exposed to view, as indicated on drawings and as specified herein, including, but not limited to, the following:
 - 1. Intumescent fireproofing.
 - 2. High-performance coating.

1.3 RELATED SECTIONS

- A. Structural steel - Section 051200.
- B. Joint sealants - Section 079200.

1.4 REFERENCES

- A. Publications listed herein are part of this specification to the extent referenced.
- B. American Society for Testing and Materials: ASTM E 119 Method for Fire Tests of Building Construction and Materials.
- C. Warnock Hersey - 2001 Certification Listings.
- D. Underwriters' Laboratories, Inc. - List of Equipment and Materials.
- E. Steel Structures Painting Council (SSPC) Surface Preparation Standards.

1.5 SYSTEM DESCRIPTION

- A. Performance Requirements: Intumescent fireproofing shall provide fire resistance compliance with requirements of the Building Code of the City of New York.
- B. Material must have B.S.A. or M.E.A. approval for use in New York City.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's literature describing product characteristics, performance, and limitation criteria, including thickness for typical shape, curing time and application sequence.
 - 1. The Architect will choose a top coat color in a satin (low luster) finish which the manufacturer will match.
 - 2. Submit schedule of material thickness for members to receive intumescent coating.
- B. Samples
 - 1. Submit two (2) samples of the intumescent fireproofing.
 - 2. The manufacturer shall provide stepped samples applied to the same material as the finished installation. The first or lowest layer is the specified primer. The middle layer is the intumescent fireproofing. The top coat is an aliphatic polyurethane enamel protective top coat. The finished application will have a smooth paint-like finish.
- C. Quality Assurance Submittals
 - 1. Test Designs/Results: Submit test designs for intumescent fireproofing prepared by a nationally recognized, certified, independent testing laboratory indicating full compliance with specified fire resistance performance requirements.
 - 2. Certificates
 - a. Provide certification that contractor/applicator utilized for application of intumescent fireproofing is approved by manufacturer.
 - b. Provide certification that specialized equipment as may be recommended by manufacturer for proper application of intumescent fireproofing shall be utilized for work of this section.
 - c. Provide certification that material has B.S.A. or M.E.A. approval for use in New York City.
 - 3. Manufacturer's Instructions: Submit manufacturer's installation procedures which shall be basis for accepting or rejecting actual installation procedures.

1.7 QUALITY ASSURANCE

- A. Qualifications
 - 1. Applicator shall be approved by manufacturer for application of intumescent fireproofing. Applicators shall be trained and qualified in techniques and procedures for proper application and shall demonstrate a minimum of five (5) years' successful experience in such application.
 - 2. Single Source Responsibility
 - a. Intumescent fireproofing, decorative, protective, top coat shall be products from a single manufacturer or approved for use by the manufacturer.

- b. Provide primers and other undercoat materials which are produced or are specifically recommended by manufacturer of intumescent fireproofing to ensure compatibility of system.
- B. Certifications: Intumescent fireproofing materials shall bear classification marking by Warnock Hersey, UL or other nationally recognized testing agency using ASTM standards and having a factory inspection service subject to approval of authorities having jurisdiction. Products shall be manufactured under testing agency's follow-up program.
- C. Adhesives, sealants, paints, and coatings used for work in this section shall meet the requirements of Section 018114, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants and Architectural Coatings," where applicable. Certification of these products shall be in accordance with the Submittal Requirements below.

1.8 DELIVERY, STORAGE, HANDLING

A. Packing, Shipping, Handling, and Unloading

- 1. Deliver products factory mixed, ready for application, in manufacturer's original unopened containers. Each container shall have manufacturer's label, intact and legible.
- 2. Include on the label for each container:
 - a. Manufacturer's name and address.
 - b. Type of coating.
 - c. Referenced Warnock Hersey, UL or nationally certified testing laboratory design number.
 - d. Warnock Hersey, UL or national certified testing laboratory seal.

B. Storage and Protection

- 1. Store materials in a clean, dry, protected area. Stack containers raised off ground, using blocking or skids to provide drainage.
- 2. Store materials at temperatures not less than 40 deg. F.
- 3. Protect material from freezing.
- 4. Discard materials which come in contact with contaminants or water, prior to actual use. Remove damaged materials from site.

1.9 PROJECT CONDITIONS

A. Environmental Requirements

- 1. Intumescent fireproofing shall not commence or proceed when steel surfaces are below 40 deg. F. or when ambient temperature is less than 40 deg. F. or expected within 24 hours.
- 2. Relative humidity shall not exceed 80% throughout total period of application and drying of intumescent fireproofing, and shall not exceed 85% throughout

application and drying period for protective decorative finish coat, unless approved by the manufacturer prior to application.

3. Provide ventilation in areas to receive intumescent fireproofing during and for 24 hours following application to dry materials.

1.10 SEQUENCING AND SCHEDULING

- A. Schedule application of intumescent fireproofing with the General Contractor. The General Contractor shall coordinate preparation and primer application with steel fabricators along with repairs and repriming of welds.
- B. Do not apply intumescent fireproofing until concrete toppings have been installed.
- C. Sequence work in conjunction with placement of hanger tabs, mechanical component hangers, electrical devices and any other similar devices connected to members scheduled to be coated.
- D. Steel surfaces with less than 36" clear working access may necessitate application of material to inaccessible surfaces prior to erection of finished steel members, either at point of fabrication or on site.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Intumescent Fireproofing: Carboline Nullifire Series S.
 1. Interior: S606.
- B. Primer: Shop applied as specified in Structural Drawings.
- C. Protective Finish Coat: Carboline coating or approved equal.
- D. Products manufactured by Nu-Chem, Albi-Clad, and Cafco Inc. shall be considered as equivalent if surface finish, texture, thickness, and specified material characteristics comply with the conditions shown for this Project, and manufacturer can provide above certifications.

2.2 MATERIALS

- A. Intumescent Fireproofing: Solvent, thin-film fireproofing.
 1. Color: Manufacturer's standard color to be maintained for the intumescent fireproofing material without colorants or additives that will affect UL rating.
 2. Ratings: As indicated on drawings.
 3. Properties
 - a. Surface Burning Characteristics: ASTM E 84.
 - 1). Flame Spread: Less than 15.
 - 2). Smoke Developed: Less than 65.
 - b. Hardness (Shore D): D65.

- c. Impact: 67 in-pounds.
- B. Intumescent Filler Paste: As approved by manufacturer.
- C. Sealer/Primer: Provide sealer/primer tinted differently from intumescent coating and appropriate base for finish top coat.
- D. Protective Finish Top Coat
 - 1. Custom color and matte finish, as selected by Architect. Provide top coat per UL test design.
 - 2. Products
 - a. Finish Coat (Field Applied): Compatible with, and of the same manufacturer as, the primer and the intermediate coat. High-build, aliphatic polyurethane, semi-gloss (low luster) finish, one of the following:
 - 1). "Carbothane 133 HB" (Carboline Co.); 3.0 to 5.0 mils d.f.t.
 - 2). "Series 180 Endura-Shield III (A2143)" (Tnemec Co. Inc.); 4.0 mils d.f.t.
 - 3). "Imron 333" (DuPont); 3.0 to 5.0 mils d.f.t.

2.3 EQUIPMENT

- A. Spray and roller equipment shall be as recommended by intumescent coating manufacturer.
- B. Dry film thickness gage.
- C. Air movement equipment.
- D. Dehumidification equipment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions
 - 1. Examine surfaces and conditions under which intumescent fireproofing is to be applied. Report any defects which may affect the work of this Section.
 - 2. Confirm compatibility of surfaces to receive fireproofing materials prior to application of fireproofing. Steel surfaces shall be primed with a compatible primer. The primer must be approved by the intumescent fireproofing manufacturer prior to shop priming to ensure sufficient adhesion. Coordinate work with requirements for structural steel as indicated in Structural Drawings to insure proper coordination.
 - 3. Applicator shall submit in writing certifications of substitute acceptance prior to proceeding with application of fireproofing.
 - 4. Correct conditions detrimental to timely and proper execution of work.

5. Verify that all clips, hangers, sleeves and similar devices have been attached.
6. Do not proceed until unsatisfactory conditions have been corrected. Beginning application indicates acceptance of substrate surfaces.

3.2 PREPARATION

- A. Clean substrate free of dust, dirt, grease or other foreign matter which would impair bond of fire resistance materials.

3.3 PROTECTION

- A. Protect adjacent surfaces and equipment from overspray of sprayed fireproofing materials.

3.4 APPLICATION

A. Intumescent Fireproofing

1. Prior to application, allow materials to reach same temperature as surface temperature of steel by storing unopened containers in areas where application is to take place.
2. No spackle compound, gypsum basecoats, additives to intumescent paint fireproofing (other than reducers approved by the manufacturer) will be acceptable.
3. Thoroughly mix intumescent fireproofing in accordance with manufacturer's instructions and apply in sufficient thickness to achieve the fire resistance rating. Apply in as many passes as necessary to cover, with uniformed texture.
4. Apply intumescent fireproofing in strict adherence with manufacturer's instructions by spray method. Brush or roller application shall be allowed only when spray application is not practical.
5. Spray apply material using heavy duty, self-cleaning (reversible), type tip. Increase distance between tip and surface if necessary to adjust orange peel effect due to pressure. Adjust fan width accordingly.
6. Fireproofing material dries quickly, a viscosity increase may be experienced after container has been opened. Keep container covered as much as possible during application. Use recirculation feature on spray equipment at all times, especially at breaks or interruptions during spraying.
7. When applying fireproofing with roller or brush, work from small containers, mixing frequently. Original pail shall be kept tightly closed and surface of material covered with plastic sheet provided for that purpose.
8. Fireproofing materials are designed for high build with minimum number of coats; however do not exceed 40 mils per dry coat, as shrinkage may occur.
9. Follow manufacturer's recommendations for recoat times and times to finish coat.

10. Final thickness shall be measured by dry film thickness gage. Do not apply protective top coat until it has been determined that required dry film thickness of intumescent fireproofing has been provided.
11. All runs, sags, orange peel in excess of 1/32" (peak to valley), depressions shall be sanded to achieve a uniform appearance in selected high finish areas.
12. Protect base coat from running water during curing process and finish coat.

B. Protective Finish Top Coat

1. Apply protective finish top coat in strict compliance with manufacturer's instructions by spray method.
2. Spray apply material using airless spray where contained and in selected high finish areas.
3. Apply protective finish top coat in compliance with wet and dry film thickness and spreading rates as recommended by manufacturer. Thickness of protective finish coat shall not exceed 4 mils dry per coat.
4. In the event of damage or other reason a portion of a member receiving the exterior intumescent cannot be painted at the time of the final coat the entire member shall be repainted. Patches are not acceptable.
5. Drying time between coats will vary with ambient temperature and humidity conditions. Successive coats shall not be applied until previous coat is dry to touch (approximately 16 hours at 77 deg. F. and 50% relative humidity).

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing and inspecting of completed applications of intumescent material will take place in successive stages, in areas of extent and using methods as follows. Do not proceed with application of fire-resistive material for the next area until test results for previously completed applications of fire-resistive material show compliance with requirements.
 1. The intumescent coating thickness shall be measured in accordance with Technical Manual 12-B, "Standard Practice of the Testing and Inspection of Field Applied Thin-Film Intumescent Fire Resistive Materials: An Annotated Guide," published by the Association of the Wall and Ceiling Industries.
 2. When testing discovers applications of fire-resistive material not in compliance with requirements, testing and inspecting agency will perform additional random testing to determine extent of noncompliance.
- C. Remove and replace applications of intumescent material where test results indicate that they do not comply with specified requirements.

- D. Apply additional fire-resistive material per manufacturer's written instructions where test results indicate that thickness does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 109000

MISCELLANEOUS SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A: Design, fabrication and installation of mobile EMS/BAG storage units as specified herein.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Shop Drawings: Submit manufacturer's shop drawings for each individual run of lockers.
- C. Samples: Submit manufacturer's standard color samples.
- D. Owner's Manual: Provide maintenance manual at closeout.
- E. Warranty: Submit manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of three years experience in the direct manufacture of lockers.
- B. Installer shall have experience in locker installation

1.4 DELIVERY, STORAGE AND HANDLING

- A: Delivery: Deliver materials to site in manufacturer's original, unopened containers with labels identifying product, manufacturer's name and country of origin.
- B: Storage: Store materials in a clean dry area.
- C: Handling: Protect materials and finish during installation and handling to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. GearGrid Corporation, 670 SW 15th Street, Forest Lake, MN 55025. Toll-free 888-643-6694. Phone 651-464-4468. Fax 651-464-4780. Web site www.geargrid.com.
- B. Or approved equal

2.2 STORAGE SYSTEMS (Basis of Design)

- A. Models:
 - 1. Model No. 422106 LKR-Mobile w/dr-20Wx20D- 6pks Quantity (2)
LKR-Mobile w/dr-20Wx20D- 3pk Quantity (1)
 - 2. GEARGRID FDNY EMS / BAG Storage Unit/Twelve Openings.

- a. Unit overall dimensions: 83" high x 75" wide x 32" deep.
- b. Clear opening width: 22.75"
- c. Nine adjustable shelves.
- d. Three bottom shelves.
- e. One top shelf

B. Construction:

- 1. Units shall be welded at all applicable joints. Forming of metal shall be completed by standard cold-forming operations. Use of fasteners will only be required to allow for knock-down shipping, securing units to mounting surface and on applicable accessories.

C. Vertical Dividers:

- 1. Outer Frames: 1.25" O.D. x 16 gauge wall thickness ASTM A513 steel tubing.
- 2. Inner Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.

D. Back Panel:

- 1. Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.

E: Bag Storage Shelves:

- 1. Shelves shall be manufactured from .25" diameter ASTM A510 cold drawn steel wire resistance welded. All bends to be cold formed. Wire surface to allow application of durable TGIC powder coated finish.

F. Base Assembly:

- A. Base Assembly: Base frame shall be manufactured from 1.25" x 11 gauge wall thickness ASTM A513 square steel tubing. Each unit to be supplied with four (4) casters per unit. Casters to have a 950 lbs. capacity per each caster. Each caster is a swivel model with brake.

2.3 DATA CABINET (Basis of Design)

- A. Models: Panduit Panzone wall mounted cabinet with solid door PZC12S. Provide Cable management options: PZCHSM2, PZBR4, PZCRR; Fan kit PZCFK and Grounding Kit PZCGK.
- (2) Patch Panels, Leviton Extreme 6 CAT 6 110-Style, 69586-U48. Provide cable management Bars and hinged wall mount brackets as required. Provide 19". 20A Rack mount PDU (1 x 10).

2.4 FINISH

- A. Standard Finish: Components to be cleaned using a phosphatized bath, clear water rinse and electro-statically coated with a durable TGIC powder coating.

B. Color: RED

Part 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lockers. Notify architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

A. Assemble mobile lockers in accordance with manufacturer's instructions.

B. Use manufacturer's hardware for assembly.

END OF SECTION

DDC PROJECT #: F175 QUEEN

PROJECT NAME: EMS Station 50

ATTACHMENT C – REVISIONS TO THE DRAWINGS

CONTRACT BID DRAWINGS:

The final Bid Drawings for this contract are uploaded on the DDC website. The upload date is 6/25/2013. If bidder cannot upload the drawings, the drawings are available at the Department of Design and Construction, First Floor.

REFER TO DRAWING D-0

1. DEMOLITION PLAN NOTE: Delete note 'RELOCATE EXIST. PARKING LIFTS, FENCE ENCLOSURE, TRAILERS AND DEBRIS BY HOSPITAL'.

REFER TO DRAWING L-0

2. PLANT SCHEDULE: Note 11 is deleted.

REFER TO DRAWING L-2

3. LEGEND: 7" Depth Conc. Pavement is revised to read 9".

REFER TO DRAWING L-5

4. DETAL 6: Key Label is revised to read 13/L-4.

REFER TO DRAWING S-1

5. REVISE NOTE: 'Below Grade Fuel Tank and Enclosure by Others' to read 'Provide Below Grade Fuel Tank and Enclosure'

REFER TO DRAWINGS H-0 and E-0

6. Fan EF-7 is deleted from the project.

REFER TO DRAWING E-4

7. Provide and install tel/data outlet at SouthEast corner of Training Kitchen Room 214.

REFER TO DRAWING E-4

8. Provide and install tel/data outlet at SouthEast corner of Training Kitchen Room 214.

REFER TO DRAWING E-2

9. Provide and install Junction Box for City Time machine in North Entry 111 ceiling.

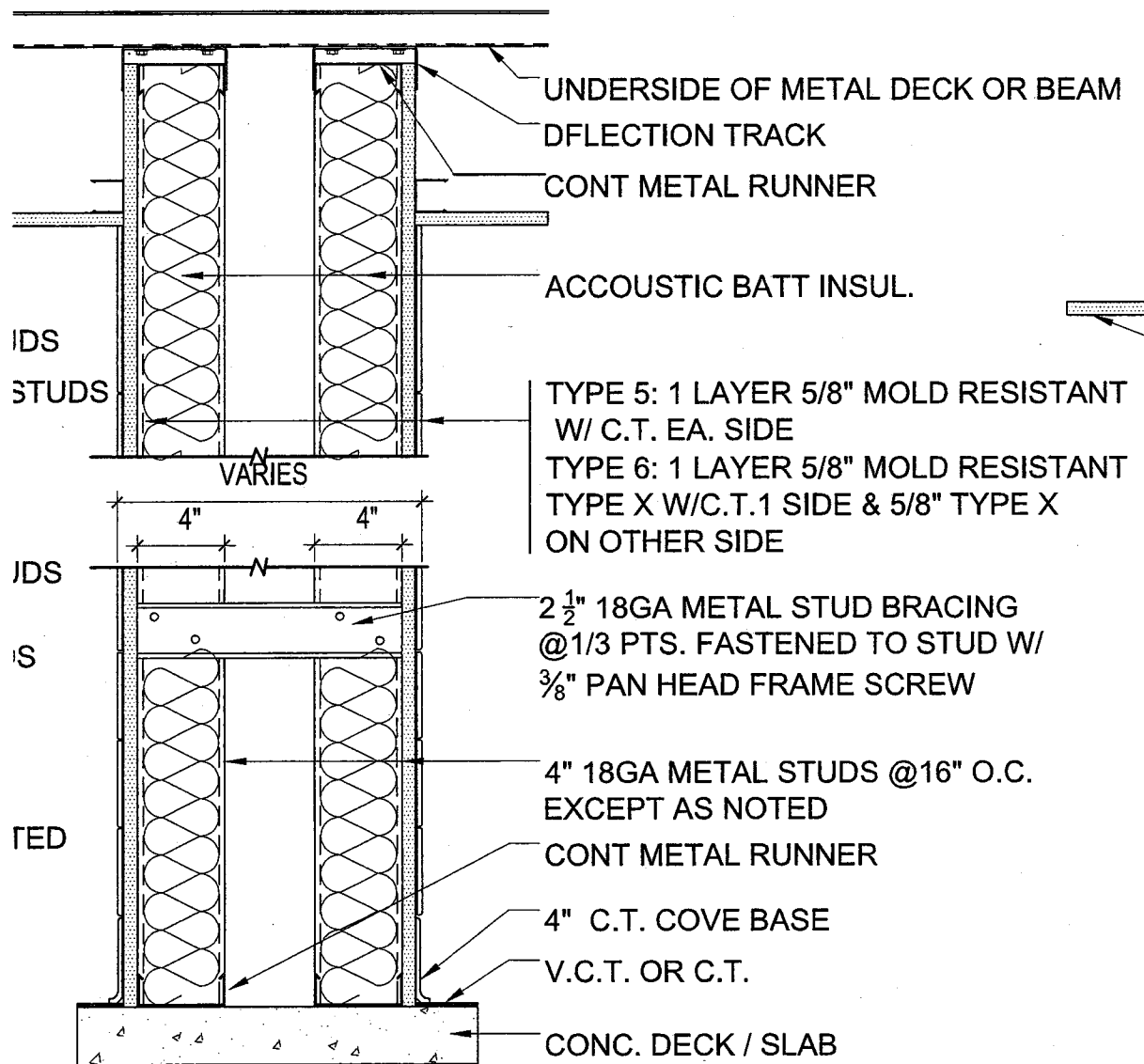
The following list of revised drawings have been included with this addendum as part of the Contract Documents:

SKETCH: Revised Type 5, 5a Chase Wall Detail

These drawings replace Drawings AR-1, AR-2 & AR-3

DRAWING H-001.00 Asbestos Abatement General Notes

DRAWING H-002.00 Underground Tunnel Asbestos Removal Plan



TYPE 5 - CHASE WALL (STC RATING 48)

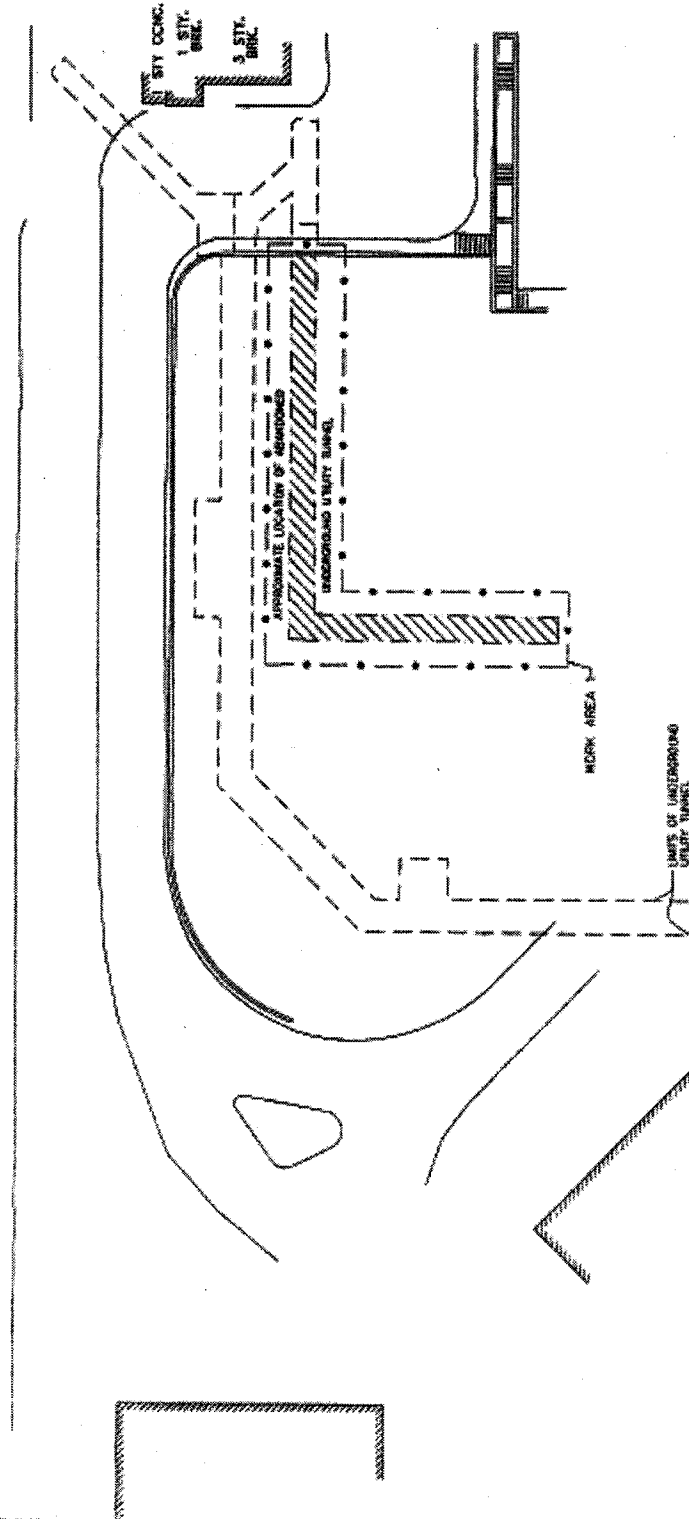
TYPE 5A - CHASE WALL (STC RATING 48)
(1 HR.-FIRE RATED) BSA #173-77-SM



159th ST.

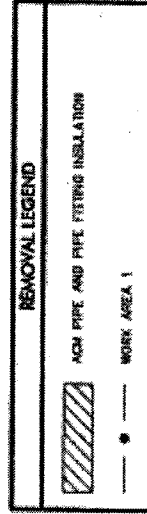
160th ST.

GOETHALS AVE.



UNDERGROUND TUNNEL

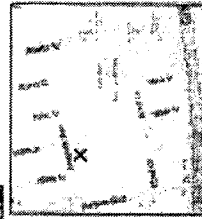
SCALE IN FEET
0 10 20 30



NOTES:

1. ALL LOCATIONS ARE APPROXIMATE AND NOT TO SCALE.

SEE PLAN



LEO Engineers, Inc.
Three South Ave.
Syosset, New York 11791



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

NO.	DATE	REVISION
1		
2		
3		
4		

CAPITAL PROJECT NUMBER: F7700000

NEW EMS STATION 58
190-19 GOETHALS AVENUE
JAMAICA, NEW YORK 11432

SHOWN TITLE

UNDERGROUND TUNNEL
ASBESTOS REMOVAL PLAN

DATE	BY	REVISION
10/1/00	J. J. J.	1
10/1/00	J. J. J.	2
10/1/00	J. J. J.	3
10/1/00	J. J. J.	4

H-002.00

DATE: 10/1/00

BY: J. J. J.

REVISION: 1

REVISION: 2

REVISION: 3

Work Area	Procedure	Removal Schedule Approximate Start/End Date	Approximate Length (ft.)	Approximate Width (ft.)	Approximate Depth (ft.)	Approximate Volume (cu yd)	Approximate Weight (tons)	Approximate Cost (\$)
1	Full Containment Procedures, and/or site specific NYC DEP guidance	10/1/00 - 10/31/00	150	10	10	1500	1500	150000

CONSULTANT PROJECT # 10-02-000

**NEW EMS STATION 50
159-10 GOETHALS AVENUE
JAMAICA, NEW YORK 11432**

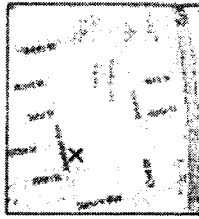
ASBESTOS ABATEMENT GENERAL NOTES:

1. ALL ASBESTOS REMOVAL SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, ORDINANCES AND ORDERS, INCLUDING BUT NOT LIMITED TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH), NEW YORK CITY LOCAL LAW 15, CHAPTER 1 RNY, AND THE NEW YORK STATE DEPARTMENT OF LABOR (NYSDOL).
2. ASBESTOS ABATEMENT CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, EQUIPMENT, SUPPLIES, ETC. NECESSARY TO SUPPORT THE WORK REQUIRED FOR ASBESTOS ABATEMENT IN ACCORDANCE WITH CONTRACT DOCUMENTS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
3. ASBESTOS ABATEMENT CONTRACTOR SHALL DEVELOP AND IMPLEMENT A WRITTEN STANDARD PROCEDURE FOR ASBESTOS WORK TO ENSURE MAXIMUM PROTECTION AND SAFEGUARD FROM ASBESTOS EXPOSURE OF THE WORKERS, VISITORS, EMPLOYEES, GENERAL PUBLIC, AND THE ENVIRONMENT.
4. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE BUNKER LABELS, WARNING AND POST INSTRUCTIONS THAT ARE NECESSARY TO PROTECT WORKERS AND VISITORS FROM THE HAZARD FROM ASBESTOS EXPOSURE. POST IN A PROMINENT AND CONSPICUOUS PLACE FOR THE WORKERS A COPY OF THE LATEST APPLICABLE REGULATIONS FROM OSHA, EPA, NIOSH, NIOSH, AND NYSDOL.
5. CITY TO NOTIFY ASBESTOS ABATEMENT CONTRACTOR OF ITEMS THAT CANNOT BE REMOVED OR REQUIRED SPECIAL ATTENTION. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE SPECIAL PROTECTION AS WELL AS DECONTAMINATION OF ALL ITEMS REMAINING IN THE WORK AREA.
6. ASBESTOS ABATEMENT CONTRACTOR SHALL KEEP WORKERS AND VISITORS AWAY FROM PORTABLE ITEMS WITHIN THE WORK AREA. CITY TO MARK ALL ITEMS THAT MAY REQUIRE SPECIAL ATTENTION (E.G., COMPUTERS, ELECTRICAL EQUIPMENT, ETC.).
7. ASBESTOS ABATEMENT CONTRACTOR SHALL NOTE THAT PORTIONS OF THE BUILDING WILL BE OCCUPIED WITHIN THE WORK AREA. CITY TO MARK ALL ITEMS THAT MAY REQUIRE SPECIAL ATTENTION (E.G., COMPUTERS, ELECTRICAL EQUIPMENT, ETC.).
8. THE ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE ALL ELECTRICAL, WATER AND WASTE CONNECTIONS, ETC. EXTENDING THROUGH THE BUILDING MATERIALS, SUPPLIES, ETC. AS REQUIRED TO FACILITATE ASBESTOS REMOVAL.
9. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL AND LIGHT THROUGHOUT THE WORK AREA AS REQUIRED IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND CODES.
10. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE PORTABLE SAFETY DETECTORS THROUGHOUT EACH WORK AREA.
11. ASBESTOS ABATEMENT CONTRACTOR SHALL PROPERLY PROTECT ALL CONTROLS, TUBING, ELECTRICAL PANELS, EQUIPMENT, ETC. WITHIN THE WORK AREA.
12. ASBESTOS ABATEMENT CONTRACTOR SHALL ISOLATE AND PROTECT ALL MECHANICAL EQUIPMENT REMAINING IN THE WORK AREA. ALL EQUIPMENT TO REMAIN SHALL BE KEPT VACUATED AND MET WIPED PRIOR TO PLACED AND UPON COMPLETION OF THE PROJECT. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE WORK BOXES AND ADEQUATE VENTILATION FOR ANY EQUIPMENT THAT WILL REMAIN IN OPERATION DURING ASBESTOS ABATEMENT. ASBESTOS ABATEMENT CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS WITH CONSULTANT AND CITY.
13. ASBESTOS ABATEMENT CONTRACTOR SHALL EXERCISE EXTREME CARE AND CAUTION DURING ANY AND ALL DEMOLITION AND ASBESTOS OPERATIONS. ASBESTOS ABATEMENT CONTRACTOR SHALL CONSIDER REMOVAL OF ALL MATERIALS FROM THE SITE WITH MAXIMUM DISTANCE PROVIDE PROPER PROTECTION AND REGULAR MAINTENANCE OF ALL BUILDING PREMISES DIRECTLY OR INDIRECTLY ASSOCIATED WITH ASBESTOS OPERATIONS.
14. ASBESTOS ABATEMENT CONTRACTOR SHALL COMPLETELY ISOLATE WORK AREA AS DESCRIBED IN CONTRACT DOCUMENTS. ALL ISOLATION BARRIERS, PERSONAL WASTE DECONTAMINATION ENCLOSURE SYSTEM (P/WDES), PLASTIC SHEETING, AIR FILTRATION SERVICES (UND) AUXILIARY MAKE-UP AIR MANIFOLD, ETC. SHALL BE IN PLACE AND APPROVED BY THE CITY PRIOR TO THE BEGINNING OF ASBESTOS REMOVAL.

15. ASBESTOS ABATEMENT CONTRACTOR SHALL LOCATE AND SEAL ALL PENETRATIONS THROUGH WALLS BETWEEN THE WORK AREA AND ADJACENT AREAS, INCLUDING BUT NOT LIMITED TO PIPE, DUCT, CONDUIT, CHASES, AND CRACKS IN THE WALLS OR FLOOR BETWEEN FLOORS AS REQUIRED BY THE FIELD CONSULTANT.
16. ASBESTOS ABATEMENT CONTRACTOR SHALL CONSTRUCT ISOLATION BARRIERS IN ORDER TO PROVIDE COMPLETE AND TOTAL ISOLATION OF THE ASBESTOS SITE FROM ALL ADJACENT AREAS. ALL ISOLATION BARRIERS SHALL BE OF WOOD 2"x4" AT 16" O.C. WITH 1/2" PLYWOOD 5/8" THICK. SEALED ON BOTH SIDES WITH TWO LAYERS OF 6 MIL PLASTIC SHEETING. CHASES AND SEAL ALL JOINTS AT THE PERIMETER. ALL MATERIALS SHALL BE FIRE RESISTANT. ASBESTOS ABATEMENT CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS. CONSTRUCTION OF BARRIERS SHALL BE CONDUCTED UNDER STREET ASBESTOS ABATEMENT CONTRACTOR.
17. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE EMERGENCY ENTRY (EASE) AS REQUIRED.
18. ASBESTOS ABATEMENT CONTRACTOR SHALL COORDINATE WITH CONSTRUCTION PROJECT MANAGER AND BUILDING ENGINEER (B.E.) AS REQUIRED.
19. ASBESTOS ABATEMENT CONTRACTOR SHALL SEPARATE AND FLAG-OUT WITH SHEET LASH AND CAP ALL RETURN AND LOW PRESSURE DUCT SYSTEMS WHICH ENTER AND EXIT THE WORK AREA AS REQUIRED. SEAL ALL CONNECTING JOINTS AIR TIGHT WITH TAPE AND PLASTIC SHEETING. COORDINATE ALL WORK WITH THE FACILITY MANAGER AND THE CONSTRUCTION PROJECT MANAGER.
20. ASBESTOS ABATEMENT CONTRACTOR SHALL INDICATE A PERSONAL WASTE DECONTAMINATION ENCLOSURE SYSTEM (P/WDES) AS INDICATED. IT SHALL BE OF SUFFICIENT SIZE TO ACCOMMODATE STORAGE OF MATERIALS, EQUIPMENT, ETC. WHILE ASBESTOS ABATEMENT CONTRACTOR IS WORKING. IT SHALL BE LOCATED IN AN AREA BETWEEN CLEAN AND CONTAMINATED AREAS.
21. SHOWER AND WASTEWATER MUST BE FILLED AND DISPOSED OF IN THE BUILDINGS SANITARY SYSTEM. REFER TO CONTRACT SPECIFICATIONS.
22. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE PORTABLE GASET-ACCIDENTED AIR FILTRATION DEVICES WITH EQUIPPED WITH HEPA FILTERS AT SIXTY EFFICIENCY TO FOUR (4) COMPLETE AIR CHANGES PER HOUR AND MAINTAIN A NEGATIVE PRESSURE DIFFERENTIAL OF 25 INCHES OF WATER.
23. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE SECURITY SUCH THAT ALL BUILDING EMPLOYEES AND VISITORS ARE PROHIBITED FROM ENTERING THE WORK AREA. ASBESTOS ABATEMENT CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE FIRE WATCH DURING ALL ASBESTOS OPERATIONS.
24. ASBESTOS ABATEMENT CONTRACTOR SHALL INSTALL AND FURNISH MANIFOLDS AS REQUIRED FOR ADEQUATE AIRFLOW. REFER TO CONTRACT SPECIFICATIONS FOR DESCRIPTION. COORDINATE ALL LOCATIONS WITH CONSTRUCTION PROJECT MANAGER.
25. ASBESTOS ABATEMENT CONTRACTOR SHALL SUPPLY ALL NECESSARY CONNECTIONS, FASTENERS, FLEXIBLE DUCTS, MANIFOLD SUPPORTS, ETC. ANY AND ALL INSTALLATIONS SHALL COMPLY WITH CONTRACT DOCUMENTS AND MANUFACTURER'S REQUIREMENTS.
26. IF APPLICABLE ASBESTOS ABATEMENT CONTRACTOR SHALL APPLY ONE (1) COAT OF SEALANT PRIOR TO POST TESTING CLEANANCE OVER ALL SURFACES FROM WHICH ASBESTOS-CONTAINING MATERIALS HAVE BEEN REMOVED. REFER TO CONTRACT SPECIFICATIONS.
27. ASBESTOS ABATEMENT CONTRACTOR SHALL HEPA VACUUM AND MET WIPED ALL BARRIERS WITHIN THE WORK AREA UPON THE COMPLETION OF ASBESTOS ABATEMENT. REFER TO CONTRACT SPECIFICATIONS.
28. ASBESTOS ABATEMENT CONTRACTOR MAY ENCOUNTER EXTENSIVE CONCRETE, BRICK, DUCTS, ETC. AND/OR CEILING. ALL ITEMS SHALL BE PROPERLY PROTECTED PRIOR TO ASBESTOS ABATEMENT AND THOROUGHLY DECONTAMINATED UPON COMPLETION OF ASBESTOS REMOVAL. REFER TO CONTRACT SPECIFICATIONS.
29. ITEMS RESULTING FROM ANY DEMOLITION AND/OR ASBESTOS ABATEMENT ACTIVITIES SHALL BE COMPOSED OF AS INDICATED IN CONTRACT DOCUMENTS ON DIRECTED BY THE CONSTRUCTION PROJECT MANAGER.

30. ALL ROUTES THROUGH THE BUILDING TO BE USED DURING THE ASBESTOS ABATEMENT OPERATIONS SHALL BE KEPT OPEN AND WITH FACILITY MANAGER AND CONSTRUCTION PROJECT MANAGER. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE ACCESSIBLE CONTAINERS FOR TRANSPORTATION OF ALL WASTE MATERIALS. ALL WASTE MATERIALS SHALL BE PROPERLY PROTECTED AND SUPERVISOR MONITORED BY THE ASBESTOS ABATEMENT CONTRACTOR.
31. UNLESS OTHERWISE NOTED, ALL WORKER AND WASTE DECONTAMINATION FACILITIES, BOTH CONTAINER AND REMOTE FROM THE WORK AREA, SHALL BE CONSTRUCTED WITH A SOLID OUTER SHELL. THE OUTER SHELL SHALL BE FRAMED WITH 2" x 4" STUDS 16" O.C. WITH A SOLID 5/8" THICK MATERIAL OF AT LEAST 50% MINIMUM THICKNESS.
32. LOCATION OF ANY REMOTE DECONTAMINATION FACILITIES SHALL BE COORDINATED AND APPROVED BY THE CITY AND THE CONSTRUCTION PROJECT MANAGER PRIOR TO THE START OF WORK.
33. AIR EXHAUST CONDUIT (AEC) EXHAUST LOCATIONS WILL BE COORDINATED WITH THE FACILITY MANAGER AND THE CONSTRUCTION PROJECT MANAGER.
34. CONTRACT CHANGES WERE PREPARED FROM EXISTING DRAWINGS SUPPLIED BY THE CITY AND PROVIDED FOR INFORMATION PURPOSES ONLY. THE CONSULTANT MAKES NO CLAIM AS TO THE ACCURACY OR ANY INFORMATION DERIVED THROUGH THESE USE.
35. ASBESTOS ABATEMENT CONTRACTOR IS RESPONSIBLE TO COORDINATE AND OBTAIN THE EXACT SCORE OF WORK FOR EACH PHASE OF ASBESTOS WITH THE GENERAL CONTRACTOR AND OTHER TRADES.
36. ASBESTOS ABATEMENT CONTRACTOR SHALL BE RESPONSIBLE FOR WEIGHING THE JOB SITE AND DETERMINING ALL CHARGES, MEASUREMENTS, AND ANY OTHER CONDITIONS RELATIVE TO THE EXISTING PROJECT. THE DRAWINGS ARE ONLY A SUMMARY OF THE INFORMATION OF THE WORK AREAS AND MAY NOT CONSTITUTE THE ACTUAL CONSTRUCTION OF THE WORK. ASBESTOS ABATEMENT CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THE TOTAL TOTAL CHARGES OF THE WORK PRIOR TO BEING NO EXTRA CHARGES WILL BE INCURRED ON ACCOUNT OF DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE INDICATED ON THE DRAWINGS. THE CITY INTENDS TO REMOVE ALL ASBESTOS-CONTAINING MATERIALS REQUIRED TO BE REMOVED FROM THE WORK AREA. THE ASBESTOS ABATEMENT CONTRACTOR SHALL PROMPTLY NOTIFY THE CITY OF ANY ADDITIONAL SUSPECT ACM BE DISCOVERED DURING ASBESTOS ACTIVITIES.
37. ASBESTOS ABATEMENT CONTRACTOR SHALL PROVIDE ALL SCAFFOLDING PLATFORM INSTALLATION, EQUIPMENT, TOOLS, TRANSPORTATION AND ANY OTHER EQUIPMENT REQUIRED AND/OR NECESSARY TO COMPLETE ALL WORK DESCRIBED IN THE CONTRACT DOCUMENTS.

SEE PLAN



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

PROJECT NUMBER 71144/009

NEW EMS STATION 50
159-10 GOETHALS AVENUE
JAMAICA, NEW YORK 11432

ASBESTOS ABATEMENT GENERAL NOTES	
DATE: 01/11/2001	SCALE: 1/8" = 1'-0"
DESIGNED BY: A. BOUTIN	PROJECT NUMBER: 71144/009
H-001.00	

REVISION	DATE	DESCRIPTION
1	01/11/2001	ASBESTOS ABATEMENT GENERAL NOTES
2	01/11/2001	UNDERGROUND TUNNEL ASBESTOS REMOVAL PLAN

DDC PROJECT #: F175 QUEEN

PROJECT NAME: EMS Station 50

ATTACHMENT D – REVISIONS TO THE BID BOOKLET

Bid Booklet: The Bid Booklet is amended as set forth below.

- Table of Contents: Delete Item #2, entitled “MWBE Program Subcontractor Utilization Plan”, and replace it with “M/WBE Program: M/WBE Utilization Plan”.
- Special Notice to Bidders: Bid Submission Requirements: Under Bid Envelope #1, delete “MWBE Subcontractor Utilization Plan (if participation goals have been established)”, and replace it with “M/WBE Utilization Plan (if Participation Goals have been established)”.
- MWBE Program Subcontractor Utilization Plan: Delete the section (pages 5,6,7,8 and 9) entitled “MWBE Program Subcontractor Utilization Plan”, and replace it with the new section entitled “M/WBE Program: M/WBE Utilization Plan” attached to this Addendum (pages 5-R, 6-R, 7-R, 8-R, 9-R, 9a).
- Bidder’s Identification of Subcontractors: Delete the language under the heading “PLEASE NOTE” from the form entitled “Bidder’s Identification of Subcontractors”, and replace it with the new language set forth below.

PLEASE NOTE: for any contract that is subject to M/WBE Participation Goals under Section 6-129 of the Administrative Code of the City of New York, if the bidder’s intention to use its own forces to do any of the above-referenced work would result in Bidder’s failure to attain the Participation Goals identified in the M/WBE Utilization Plan, the bid will be non-responsive unless the bidder requests and obtains a full or partial waiver of the Participation Goals (M/WBE Utilization Plan, Part III) in advance of bid submission. For more information see Notice to All Prospective Contractors, Participation by Minority-Owned and Women-Owned Business Enterprises in City Procurement.

M/WBE PROGRAM

M/WBE UTILIZATION PLAN

M/WBE Program Requirements: The requirements for the M/WBE Program are set forth on the following pages of this Bid Booklet, in the section entitled "Notice to All Prospective Contractors".

Schedule B: M/WBE Utilization Plan: Schedule B: M/WBE Utilization Plan for this Contract is set forth in this Bid Booklet on the pages following the section entitled "Notice to All Prospective Contractors". The M/WBE Utilization Plan (Part I) indicates whether Participation Goals have been established for this Contract. If Participation Goals have been established for this Contract, the bidder must submit an M/WBE Utilization Plan (Part II) with its bid.

Waiver: The bidder may seek a full or partial pre-award waiver of the Participation Goals in accordance with the "Notice to All Prospective Contractors" (See Part A, Section 10). The bidder's request for a waiver must be submitted at least seven (7) calendar days prior to the bid date. Waiver requests submitted after the deadline will not be considered. The form for requesting a waiver of the Participation Goals is set forth in the M/WBE Utilization Plan (Part III).

Rejection of the Bid: The bidder must complete Schedule B: M/WBE Utilization Plan (Part II) set forth in this Bid Booklet on the pages following the section entitled "Notice to All Prospective Contractors". A Schedule B submitted by the bidder which does not include the Vendor Certification and Required Affirmations (See Section V of Part II) will be deemed to be non-responsive, unless a full waiver of the Participation Goals is granted (Schedule B, Part III). In the event that the City determines that the bidder has submitted a Schedule B where the Vendor Certification and Required Affirmations are completed but other aspects of the Schedule B are not complete, or contain a copy or computation error that is at odds with the Vendor Certification and Required Affirmations, the bidder will be notified by the Agency and will be given four (4) calendar days from receipt of notification to cure the specified deficiencies and return a completed Schedule B to the Agency. Failure to do so will result in a determination that the Bid is non-responsive. Receipt of notification is defined as the date notice is emailed or faxed (if the bidder has provided an email address or fax number), or no later than five (5) calendar

Impact on LBE Requirements: If Participation Goals have been established for the participation of M/WBEs, the contractor is not required to comply with the Locally Based Enterprise Program ("LBE"). The LBE Program is set forth in Article 67 of the Contract.

Tax ID #: _____

APT E-
PIN#: 85013B0106

Contract # 1 - General Construction Work

SCHEDULE B - M/WBE Utilization Plan**Part I: M/WBE Participation Goals**

Part I to be completed by contracting agency

Contract Overview

APT E-Pin # 85013B0106 FMS Project ID#: F175QUEEN

Project Title/Agency NEW EMS STATION 50

PIN # 8502013FI0003C

Bid/Proposal
Response Date: July 17, 2013

Contracting Agency Department of Design and Construction

Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101

Contact Person James A. Cerasoli Title Deputy Director

Telephone # (718) 391-1549 Email cerasoli@ddc.nyc.gov

Project Description (attach additional pages if necessary)

This Project consists of the construction of a new EMS Station at the Queens Hospital Campus for the FDNY. The building is a two story steel frame with concrete foundations on piles

M/WBE Participation Goals for Services

Enter the percentage amount for each group or for an unspecified goal.

Prime Contract Industry: Construction

Group	Percentage
<u>Unspecified</u>	<u>%</u>
or	
Black American	<u>%</u>
Hispanic American	<u>%</u>
Asian American	<u>%</u>
Women	<u>%</u>
Total Participation Goals	To be provided

Line 1

Tax ID #: _____

APT E-

PIN#: 85013B0106**SCHEDULE B - Part II: M/WBE Participation Plan**

Part II to be completed by the bidder/proposer:

Please note: For Non-M/WBE Prime Contractors who will NOT subcontract any services and will self-perform the entire contract, you must obtain a FULL waiver by completing the Waiver Application on pages 9 and 9a and timely submitting it to the contracting agency pursuant to the Notice to Prospective Contractors. Once a FULL WAIVER is granted, it must be included with your bid or proposal and you do not have to complete or submit this form with your bid or proposal.

Section I: Prime Contractor Contact Information

Tax ID # _____	FMS Vendor ID # _____
Business Name _____	Contact Person _____
Address _____	
Telephone # _____	Email _____

Section II: M/WBE Utilization Goal Calculation: Check the applicable box and complete subsection.**PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS**

☐ For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Agency M/WBE Participation Goals.

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total Bid/Proposal Value	Agency Total Participation Goals (Line 1, Page 1)	Calculated M/WBE Participation Amount
\$ _____	X _____	= \$ _____ Line 2

PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS

☐ For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Modified M/WBE Participation Goals.

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total Bid/Proposal Value	Adjusted Participation Goal (From Partial Waiver)	Calculated M/WBE Participation Amount
\$ _____	X _____	= \$ _____ Line 3

Section III: M/WBE Utilization Plan: How Proposer/Bidder Will Fulfill M/WBE Participation Goals. Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation. Check applicable box. The Proposer or Bidder will fulfill the M/WBE Participation Goals:

☐ As an M/WBE Prime Contractor that will self-perform and/or subcontract to other M/WBE firms a portion of the contract the value of which is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals. Please check all that apply to Prime Contractor:

☐ MBE ☐ WBE

☐ As a Qualified Joint Venture with an M/WBE partner, in which the value of the M/WBE partner's participation and/or the value of any work subcontracted to other M/WBE firms is at least the amount located on Lines 2 or 3 above, as applicable. The value of any work subcontracted to non M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals.

☐ As a non M/WBE Prime Contractor that will enter into subcontracts with M/WBE firms the value of which is at least the amount located on Lines 2 or 3 above, as applicable.

Section IV: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status? % _____

Enter brief description of the type(s) and dollar value of subcontracts for all any services you plan on subcontracting if awarded this contract. For each item, indicate whether the work is designated for participation by MBEs and/or WBEs and the time frame in which such work is scheduled to begin and end. Use additional sheets if necessary.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

✓ **Scopes of Subcontract Work**

Section V: Vendor Certification and Required Affirmations

I hereby:

- 1) acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York (Section 6-129), and the rules promulgated thereunder;
- 2) affirm that the information supplied in support of this M/WBE Utilization Plan is true and correct;
- 3) agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract
- 4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and
- 5) agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Signature _____

Date _____

Print Name _____

Title _____

SCHEDULE B – PART III – REQUEST FOR WAIVER OF M/WBE PARTICIPATION REQUIREMENT

Contract Overview			
Tax ID #			FMS Vendor ID #
Business Name			
Contact Name	Telephone #	Email	
Type of Procurement	<input type="checkbox"/> Competitive Sealed Bids	<input type="checkbox"/> Other	Bid/Response Due Date
APTE-PIN # (for this procurement):		Contracting Agency:	

M/WBE Participation Goals as described in bid/solicitation documents	
%	Agency M/WBE Participation Goal
Proposed M/WBE Participation Goal as anticipated by vendor seeking waiver	
%	of the total contract value anticipated in good faith by the bidder/proposer to be subcontracted for services and/or credited to an M/WBE Prime Contractor or Qualified Joint Venture.
Basis for Waiver Request: Check appropriate box & explain in detail below (attach additional pages if needed)	

- ☐ Vendor does not subcontract services, and has the capacity and good faith intention to perform all such work itself with its own employees.
- ☐ Vendor subcontracts *some* of this type of work but at a *lower* % than bid/solicitation describes, and has the capacity and good faith intention to do so on this contract. (Attach subcontracting plan outlining services that the vendor will self-perform and subcontract to other vendors or consultants.)
- ☐ Vendor has other legitimate business reasons for proposing the M/WBE Participation Goal above. Explain under separate cover.

References		
List 3 most recent contracts performed for NYC agencies (if any). Include information for each subcontract awarded in performance of such contracts. Add more pages if necessary.		
CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract
CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract
CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract

List 3 most recent contracts performed for other entities. Include information for each subcontract awarded in performance of such contracts. Add more pages if necessary.

(Complete ONLY if vendor has performed fewer than 3 New York City contracts.)

TYPE OF Contract	ENTITY	DATE COMPLETED
Manager at entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Type of Work Subcontracted		

TYPE OF Contract	AGENCY/ENTITY	DATE COMPLETED
Manager at agency/entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract

TYPE OF Contract	AGENCY/ENTITY	DATE COMPLETED
Manager at entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract

VENDOR CERTIFICATION: I hereby affirm that the information supplied in support of this waiver request is true and correct, and that this request is made in good faith.

Signature: _____	Date: _____
Print Name: _____	Title: _____

Shaded area below is for agency completion only

AGENCY CHIEF CONTRACTING OFFICER APPROVAL	
Signature: _____	Date: _____
CITY CHIEF PROCUREMENT OFFICER APPROVAL	
Signature: _____	Date: _____

Waiver Determination

Full Waiver Approved: ☐
 Waiver Denied: ☒
 Partial Waiver Approved: ☐
 Revised Participation Goal: _____ %

DDC PROJECT #: F175 QUEEN

PROJECT NAME: EMS Station 50

ATTACHMENT E – REVISIONS TO VOLUME 2

Contract: The Contract is amended as set forth below.

- Delete Article 77, entitled “Participation by Minority-Owned and Women-Owned Business Enterprises in City Procurement”, in its entirety, and replace it with new Article 77. New Article 77 is IDENTICAL in all respects to the section entitled “Notice to All Prospective Contractors: Participation by Minority-Owned and Women-Owned Business Enterprises in City Procurement” attached to this Addendum .

- Prevailing Wages:
The latest Prevailing Wage Schedule is included with this Addendum.

- Project Labor Agreement:
The Project Labor Agreement for the Queens Hospital EMS Station is included with this Addendum.

NOTICE TO ALL PROSPECTIVE CONTRACTORS

PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT

ARTICLE I. M/WBE PROGRAM

Local Law No. 129 of 2005 added and Local Law 1 of 2013 amended Section 6-129 of the Administrative Code of the City of New York (hereinafter "Section 6-129"). Section 6-129 establishes the program for participation in City procurement ("M/WBE Program") by minority-owned business enterprises ("MBEs") and women-owned business enterprises ("WBEs"), certified in accordance with Section 1304 of the New York City Charter. As stated in Section 6-129, the intent of the program is to address the impact of discrimination on the City's procurement process, and to promote the public interest in avoiding fraud and favoritism in the procurement process, increasing competition for City business, and lowering contract costs. The contract provisions contained herein are pursuant to Section 6-129, and the rules of the Department of Small Business Services ("DSBS") promulgated thereunder.

If this Contract is subject to the M/WBE Program established by Section 6-129, the specific requirements of MBE and/or WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "M/WBE Utilization Plan"), and are detailed below. The Contractor must comply with all applicable MBE and WBE requirements for this Contract.

All provisions of Section 6-129 are hereby incorporated in the Contract by reference and all terms used herein that are not defined herein shall have the meanings given such terms in Section 6-129. Article I, Part A, below, sets forth provisions related to the participation goals for construction, standard and professional services contracts. Article I, Part B, below, sets forth miscellaneous provisions related to the M/WBE Program.

PART A

PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

1. The MBE and/or WBE Participation Goals established for this Contract or Task Orders issued pursuant to this Contract, ("Participation Goals"), as applicable, are set forth on Schedule B, Part I to this Contract (see Page 1, line 1 Total Participation Goals) or will be set forth on Schedule B, Part I to Task Orders issued pursuant to this Contract, as applicable.

The Participation Goals represent a percentage of the total dollar value of the Contract or Task Order, as applicable, that may be achieved by awarding subcontracts to firms certified with New York City Department of Small Business Services as MBEs and/or WBEs, and/or by crediting the participation of prime contractors and/or qualified joint ventures as provided in Section 3 below, unless the goals have been waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

2. If Participation Goals have been established for this Contract or Task Orders issued pursuant to this Contract, Contractor agrees or shall agree as a material term of the Contract that Contractor shall be subject to the Participation Goals, unless the goals are waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

3. If Participation Goals have been established for this Contract or Task Order issued pursuant to this Contract, a Contractor that is an MBE and/or WBE shall be permitted to count its own participation toward fulfillment of the relevant Participation Goal, provided that in accordance with Section 6-129 the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that the Contractor pays to direct subcontractors (as defined in Section 6-129(c)(13)), and provided further that a Contractor that is certified as both an MBE and a WBE may count its own participation either toward the goal for MBEs or the goal for WBEs, but not both.

A Contractor that is a qualified joint venture (as defined in Section 6-129(c)(30)) shall be permitted to count a percentage of its own participation toward fulfillment of the relevant Participation Goal. In accordance with Section 6-129, the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as

applicable, any amounts that Contractor pays to direct subcontractors, and then multiplying the remainder by the percentage to be applied to total profit to determine the amount to which an MBE or WBE is entitled pursuant to the joint venture agreement, provided that where a participant in a joint venture is certified as both an MBE and a WBE, such amount shall be counted either toward the goal for MBEs or the goal for WBEs, but not both.

4. A. If **Participation Goals** have been established for this Contract, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Utilization Plan, Part II (see Pages 2-4) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; and (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end. In the event that this M/WBE Utilization Plan indicates that the bidder or proposer, as applicable, does not intend to meet the **Participation Goals**, the bid or proposal, as applicable, shall be deemed non-responsive, unless Agency has granted the bidder or proposer, as applicable, a pre- award waiver of the Participation Goals in accordance with Section 6-129 and Part A, Section 10 below.

B. (i) If this Contract is for a master services agreement or other requirements type contract that will result in the issuance of Task Orders that will be individually registered ("Master Services Agreement") and is subject to M/WBE **Participation Goals**, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Participation Requirements for Master Services Agreements That Will Require Individually Registered Task Orders, Part II (page 2) indicating the prospective contractor's certification and required affirmations to make all reasonable good faith efforts to meet participation goals established on each individual Task Order issued pursuant to this Contract, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified **Participation Goals** by soliciting and obtaining the participation of certified MBE and/or WBE firms. In the event that the Schedule B indicates that the bidder or proposer, as applicable, does not intend to meet the **Participation Goals** that may be established on Task Orders issued pursuant to this Contract, the bid or proposal, as applicable, shall be deemed nonresponsive.

(ii) **Participation Goals** on a Master Services Agreement will be established for individual Task Orders issued after the Master Services Agreement is awarded. If **Participation Goals** have been established on a Task Order, a contractor shall be required to submit a Schedule B – M/WBE Utilization Plan For Independently Registered Task Orders That Are Issued Pursuant to Master Services Agreements, Part II (see Pages 2-4) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; and (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end. The contractor must engage in good faith efforts to meet the **Participation Goals** as established for the Task Order unless Agency has granted the contractor a pre-award waiver of the Participation Goals in accordance with Section 6-129 and Part A, Section 10 below.

C. **THE BIDDER/PROPOSER MUST COMPLETE THE SCHEDULE B INCLUDED HEREIN (SCHEDULE B, PART II). A SCHEDULE B SUBMITTED BY THE BIDDER/PROPOSER WHICH DOES NOT INCLUDE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS (SEE SECTION V OF PART II) WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE PARTICIPATION GOALS IS GRANTED (SCHEDULE B, PART III). IN THE EVENT THAT THE CITY DETERMINES THAT THE BIDDER/PROPOSER HAS SUBMITTED A SCHEDULE B WHERE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS ARE COMPLETED BUT OTHER ASPECTS OF THE SCHEDULE B ARE NOT COMPLETE, OR CONTAIN A COPY OR COMPUTATION ERROR THAT IS AT ODDS WITH THE VENDOR CERTIFICATION AND AFFIRMATIONS, THE BIDDER/PROPOSER WILL BE NOTIFIED BY THE AGENCY AND WILL BE GIVEN FOUR (4) CALENDAR DAYS FROM RECEIPT OF NOTIFICATION TO CURE THE SPECIFIED DEFICIENCIES AND RETURN A COMPLETED SCHEDULE B TO THE AGENCY. FAILURE TO DO SO WILL RESULT IN A DETERMINATION THAT THE BID/PROPOSAL IS NON-RESPONSIVE. RECEIPT OF NOTIFICATION IS DEFINED AS THE DATE NOTICE IS E-MAILED OR FAXED (IF THE BIDDER/PROPOSER HAS PROVIDED AN E-MAIL ADDRESS OR FAX NUMBER), OR NO LATER THAN FIVE (5) CALENDAR DAYS FROM THE DATE OF MAILING OR UPON DELIVERY, IF DELIVERED.**

5. Where an M/WBE Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multiyear contracts, such list shall also be submitted every year thereafter. The Agency may also require the Contractor to report periodically about the contracts awarded by its direct subcontractors to indirect subcontractors (as defined in Section 6-129(c)(22)). **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below \$3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at**

the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor must identify all those to which it intends to award construction subcontracts for any portion of the Wicks trade work at the time of bid submission, regardless of what point in the life of the contract such subcontracts will occur. In identifying intended subcontractors in the bid submission, bidders may satisfy any Participation Goals established for this Contract by proposing one or more subcontractors that are MBEs and/or WBEs for any portion of the Wicks trade work. In the event that the Contractor's selection of a subcontractor is disapproved, the Contractor shall have a reasonable time to propose alternate subcontractors.

6. MBE and WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the **Participation Goals**. Such certification must occur prior to the firms' commencement of work. A list of MBE and WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6356, or by visiting or writing DSBS at 110 William St., New York, New York, 10038, 7th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

7. Where an **M/WBE Utilization Plan** has been submitted, the Contractor shall, with each voucher for payment, and/or periodically as Agency may require, submit statements, certified under penalty of perjury, which shall include, but not be limited to, the total amount the Contractor paid to its direct subcontractors, and, where applicable pursuant to Section 6-129(j), the total amount direct subcontractors paid to indirect subcontractors; the names, addresses and contact numbers of each MBE or WBE hired as a subcontractor by the Contractor, and, where applicable, hired by any of the Contractor's direct subcontractors; and the dates and amounts paid to each MBE or WBE. The Contractor shall also submit, along with its voucher for final payment: the total amount it paid to subcontractors, and, where applicable pursuant to Section 6-129(j), the total amount its direct subcontractors paid directly to their indirect subcontractors; and a final list, certified under penalty of perjury, which shall include the name, address and contact information of each subcontractor that is an MBE or WBE, the work performed by, and the dates and amounts paid to each.

8. If payments made to, or work performed by, MBEs or WBEs are less than the amount specified in the Contractor's **M/WBE Utilization Plan**, Agency shall take appropriate action, in accordance with Section 6-129 and Article II below, unless the Contractor has obtained a modification of its **M/WBE Utilization Plan** in accordance with Section 6-129 and Part A, Section 11 below.

9. Where an **M/WBE Utilization Plan** has been submitted, and the Contractor requests a change order the value of which exceeds the greater of 10 percent of the Contract or Task Order, as applicable, or \$500,000, Agency shall review the scope of work for the Contract or Task Order, as applicable, and the scale and types of work involved in the change order, and determine whether the **Participation Goals** should be modified.

10. Pre-award waiver of the **Participation Goals**. (a) A bidder or proposer, or contractor with respect to a Task Order, may seek a pre-award full or partial waiver of the **Participation Goals** in accordance with Section 6-129, which requests that Agency change one or more **Participation Goals** on the grounds that the **Participation Goals** are unreasonable in light of the availability of certified firms to perform the services required, or by demonstrating that it has legitimate business reasons for proposing a lower level of subcontracting in its **M/WBE Utilization Plan**.

(b) To apply for a full or partial waiver of the **Participation Goals**, a bidder, proposer, or contractor, as applicable, must complete Part III (Page 5) of Schedule B and submit such request no later than seven (7) calendar days prior to the date and time the bids, proposals, or Task Orders are due, in writing to the Agency by email at poped@ddc.nyc.gov or via facsimile at (718) 391-1885. Bidders, proposers, or contractors, as applicable, who have submitted requests will receive an Agency response by no later than two (2) calendar days prior to the due date for bids, proposals, or Task Orders; provided, however, that if that date would fall on a weekend or holiday, an Agency response will be provided by close-of-business on the business day before such weekend or holiday date.

(c) If the Agency determines that the **Participation Goals** are unreasonable in light of the availability of certified firms to perform the services required, it shall revise the solicitation and extend the deadline for bids and proposals, or revise the Task Order, as applicable.

(d) Agency may grant a full or partial waiver of the **Participation Goals** to a bidder, proposer or contractor, as applicable, who demonstrates—before submission of the bid, proposal or Task Order, as applicable—that it has legitimate business reasons for proposing the level of subcontracting in its **M/WBE Utilization Plan**. In making its determination, Agency shall consider factors that shall include, but not be limited to, whether the bidder, proposer or contractor, as applicable, has the capacity and the bona fide intention to perform the Contract without any subcontracting, or to perform the Contract without awarding the amount of subcontracts represented by the **Participation Goals**. In making such determination, Agency may consider whether the **M/WBE Utilization Plan** is consistent with past subcontracting practices of the bidder, proposer or contractor, as applicable, whether the bidder, proposer or contractor, as applicable, has made efforts to form a joint venture with a certified firm, and whether the bidder, proposer, or contractor, as applicable, has made good faith efforts to identify other portions of the Contract that it intends to subcontract.

11. **Modification of M/WBE Utilization Plan.** (a) A Contractor may request a modification of its **M/WBE Utilization Plan** after award of this Contract. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below \$3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor may request a Modification of its M/WBE Utilization Plan as part of its bid submission.** The Agency may grant a request for Modification of a Contractor's **M/WBE Utilization Plan** if it determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts to meet the **Participation Goals**. In making such determination, Agency shall consider evidence of the following efforts, as applicable, along with any other relevant factors:

- (i) The Contractor advertised opportunities to participate in the Contract, where appropriate, in general circulation media, trade and professional association publications and small business media, and publications of minority and women's business organizations;
- (ii) The Contractor provided notice of specific opportunities to participate in the Contract, in a timely manner, to minority and women's business organizations;
- (iii) The Contractor sent written notices, by certified mail or facsimile, in a timely manner, to advise MBEs or WBEs that their interest in the Contract was solicited;
- (iv) The Contractor made efforts to identify portions of the work that could be substituted for portions originally designated for participation by MBEs and/or WBEs in the **M/WBE Utilization Plan**, and for which the Contractor claims an inability to retain MBEs or WBEs;
- (v) The Contractor held meetings with MBEs and/or WBEs prior to the date their bids or proposals were due, for the purpose of explaining in detail the scope and requirements of the work for which their bids or proposals were solicited;
- (vi) The Contractor made efforts to negotiate with MBEs and/or WBEs as relevant to perform specific subcontracts, or act as suppliers or service providers;
- (vii) Timely written requests for assistance made by the Contractor to Agency's **M/WBE liaison officer** and to **DSBS**;
- (viii) Description of how recommendations made by **DSBS** and Agency were acted upon and an explanation of why action upon such recommendations did not lead to the desired level of participation of MBEs and/or WBEs.

Agency's **M/WBE officer** shall provide written notice to the Contractor of the determination.

(b) The Agency may modify the **Participation Goals** when the scope of the work has been changed by the Agency in a manner that affects the scale and types of work that the Contractor indicated in its **M/WBE Utilization Plan** would be awarded to subcontractors.

12. If this Contract is for an indefinite quantity of construction, standard or professional services or is a requirements type contract and the Contractor has submitted an **M/WBE Utilization Plan** and has committed to subcontract work to MBEs and/or WBEs in order to meet the **Participation Goals**, the Contractor will not be deemed in violation of the **M/WBE Program** requirements for this Contract with regard to any work which was intended to be subcontracted to an MBE and/or WBE to the extent that the Agency has determined that such work is not needed.

13. If **Participation Goals** have been established for this Contract or a Task Order issued pursuant to this Contract, at least once annually during the term of the Contract or Task Order, as applicable, Agency shall review the Contractor's progress toward attainment of its **M/WBE Utilization Plan**, including but not limited to, by reviewing the percentage of work the Contractor has actually awarded to MBE and/or WBE subcontractors and the payments the Contractor made to such subcontractors.

14. If **Participation Goals** have been established for this Contract or a Task Order issued pursuant to this Contract, Agency shall evaluate and assess the Contractor's performance in meeting those goals, and such evaluation and assessment shall become part of the Contractor's overall contract performance evaluation.

PART B: MISCELLANEOUS

1. The Contractor shall take notice that, if this solicitation requires the establishment of an **M/WBE** Utilization Plan, the resulting contract may be audited by DSBS to determine compliance with Section 6-129. See §6-129(e)(10). Furthermore, such resulting contract may also be examined by the City's Comptroller to assess compliance with the **M/WBE** Utilization Plan.

2. Pursuant to DSBS rules, construction contracts that include a requirement for an **M/WBE** Utilization Plan shall not be subject to the law governing Locally Based Enterprises set forth in Section 6-108.1 of the Administrative Code of the City of New York.

3. DSBS is available to assist contractors and potential contractors in determining the availability of MBEs and/or WBEs to participate as subcontractors, and in identifying opportunities that are appropriate for participation by MBEs and/or WBEs in contracts.

4. Prospective contractors are encouraged to enter into qualified joint venture agreements with MBEs and/or WBEs as defined by Section 6-129(c)(30).

5. By submitting a bid or proposal the Contractor hereby acknowledges its understanding of the **M/WBE** Program requirements set forth herein and the pertinent provisions of Section 6-129, and any rules promulgated thereunder, and if awarded this Contract, the Contractor hereby agrees to comply with the **M/WBE** Program requirements of this Contract and pertinent provisions of Section 6-129, and any rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract. The Contractor hereby agrees to make all reasonable, good faith efforts to solicit and obtain the participation of MBEs and/or WBEs to meet the required **Participation Goals**.

ARTICLE II. ENFORCEMENT

1. If Agency determines that a bidder or proposer, as applicable, has, in relation to this procurement, violated Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, Agency may disqualify such bidder or proposer, as applicable, from competing for this Contract and the Agency may revoke such bidder's or proposer's prequalification status, if applicable.

2. Whenever Agency believes that the Contractor or a subcontractor is not in compliance with Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to any **M/WBE** Utilization Plan, Agency shall send a written notice to the Contractor describing the alleged noncompliance and offering the Contractor an opportunity to be heard. Agency shall then conduct an investigation to determine whether such Contractor or subcontractor is in compliance.

3. In the event that the Contractor has been found to have violated Section 6-129, the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to, any **M/WBE** Utilization Plan, Agency may determine that one of the following actions should be taken:

- (a) entering into an agreement with the Contractor allowing the Contractor to cure the violation;
- (b) revoking the Contractor's pre-qualification to bid or make proposals for future contracts;
- (c) making a finding that the Contractor is in default of the Contract;
- (d) terminating the Contract;
- (e) declaring the Contractor to be in breach of Contract;
- (f) withholding payment or reimbursement;
- (g) determining not to renew the Contract;
- (h) assessing actual and consequential damages;
- (i) assessing liquidated damages or reducing fees, provided that liquidated damages may be based on amounts representing costs of delays in carrying out the purposes of the **M/WBE** Program, or in meeting the purposes of the

Contract, the costs of meeting utilization goals through additional procurements, the administrative costs of investigation and enforcement, or other factors set forth in the Contract;

- (j) exercising rights under the Contract to procure goods, services or construction from another contractor and charge the cost of such contract to the Contractor that has been found to be in noncompliance; or
- (k) taking any other appropriate remedy.

4. If an **M/WBE** Utilization Plan has been submitted, and pursuant to this Article II, Section 3, the Contractor has been found to have failed to fulfill its **Participation Goals** contained in its **M/WBE** Utilization Plan or the **Participation Goals** as modified by Agency pursuant to Article I, Part A, Section 11, Agency may assess liquidated damages in the amount of ten percent (10%) of the difference between the dollar amount of work required to be awarded to MBE and/or WBE firms to meet the **Participation Goals** and the dollar amount the Contractor actually awarded and paid, and/or credited, to MBE and/or WBE firms. In view of the difficulty of accurately ascertaining the loss which the City will suffer by reason of Contractor's failure to meet the **Participation Goals**, the foregoing amount is hereby fixed and agreed as the liquidated damages that the City will suffer by reason of such failure, and not as a penalty. Agency may deduct and retain out of any monies which may become due under this Contract the amount of any such liquidated damages; and in case the amount which may become due under this Contract shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

5. Whenever Agency has reason to believe that an MBE and/or WBE is not qualified for certification, or is participating in a contract in a manner that does not serve a commercially useful function (as defined in Section 6-129(c)(8)), or has violated any provision of Section 6-129, Agency shall notify the Commissioner of DSBS who shall determine whether the certification of such business enterprise should be revoked.

6. Statements made in any instrument submitted to Agency pursuant to Section 6-129 shall be submitted under penalty of perjury and any false or misleading statement or omission shall be grounds for the application of any applicable criminal and/or civil penalties for perjury. The making of a false or fraudulent statement by an MBE and/or WBE in any instrument submitted pursuant to Section 6-129 shall, in addition, be grounds for revocation of its certification.

7. The Contractor's record in implementing its **M/WBE** Utilization Plan shall be a factor in the evaluation of its performance. Whenever Agency determines that a Contractor's compliance with an **M/WBE** Utilization Plan has been unsatisfactory, Agency shall, after consultation with the City Chief Procurement Officer, file an advice of caution form for inclusion in VENDEX as caution data.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

LABOR LAW §220 PREVAILING WAGE SCHEDULE

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to Labor Law §220 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work contracts.

Contracting agencies anticipating doing work which requires the employment of a trade or classification not included in this schedule must request the Comptroller to establish a proper classification for the work pursuant to Labor Law §220 (3-a) (a). The prevailing rate schedule as promulgated by the Comptroller, must, in compliance with law, be annexed to and form part of the contract.

Contractors are solely responsible for maintaining original payroll records which delineate, among other things, the hours each employee worked within a given classification. Contractors using rates and/or classifications not promulgated by the Comptroller do so at their own risk. Additionally, prior to bid, Agency Chief Contracting Officers must contact the Bureau of Labor Law when the need arises for a work classification not published in this schedule.

The appropriate schedule of prevailing wages and benefits must be posted at all public work sites pursuant to Labor Law §220 (3-a) (a).

This schedule is applicable for work performed during the effective period, unless otherwise noted. You will be notified of any changes to this schedule by addenda published on our web site at www.comptroller.nyc.gov. The rate of wages and supplemental benefits to be paid or provided are those that prevail at the time the work is being performed. Preliminary schedules for future one-year periods are published annually in the City Record on or about June 1st of each succeeding year. Final schedules are published on or about July 1st in the City Record and on our web site at www.comptroller.nyc.gov.

The Comptroller's Office has attempted to include all overtime, shift and night differential, Holiday, Saturday, Sunday or other premium time work. However, this schedule does not set forth every prevailing practice with respect to such rates with which employers must comply. All such practices are nevertheless part of the employer's prevailing wage obligation and contained in the collective bargaining agreements of the prevailing wage unions. These collective bargaining agreements are available for inspection by appointment. Requests for appointments may be made by calling (212) 669-4443, Monday through Friday between the hours of 9 a.m. and 5 p.m.

Answers to questions concerning prevailing trade practices may be obtained from the Classification Unit by calling (212) 669-7974. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasyl Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 1122, New York, N.Y. 10007; Fax (212) 669-4002.

Prevailing rates and ratios for apprentices are attached to this schedule in the Appendix. Pursuant to Labor Law §220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the New York State Department of Labor, may be employed on a public work project. Workers who are not journey persons or not registered apprentices pursuant to Labor Law §220 (3-e) may not be substituted for apprentices and must be paid as journey persons.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

ASBESTOS HANDLER

(Hazardous Material; Disturbs, removes, encapsulates, repairs, or encloses friable asbestos material)

Asbestos Handler

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$35.90

Supplemental Benefit Rate per Hour: \$15.05

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Sunday.

Time and one half the regular hourly rate after 40 hours in any work week.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Easter

Paid Holidays

None

(Local #78 and Local #12A)

BLASTER

Blaster

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$44.40

Supplemental Benefit Rate per Hour: \$38.44

Blaster (Hydraulic)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$45.17

Supplemental Benefit Rate per Hour: \$38.44

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

All Other Employees:

Time and one-half for the first eight hours of work on Saturday and for Make-up Time. Double time for all hours over eight Monday through Friday (except make-up hours) and for all hours worked on Sunday and Holidays.

Overtime

Double time the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

A single shift shall be 8 hours plus an unpaid lunch, starting at 8:00 A.M (or between 6:00 A.M. and 10:00 A.M. on weekdays). When two (2) shifts are employed, each shift shall be 8 hours plus ½ hour unpaid lunch. When three (3) shifts are employed, each shift will work seven and one-half (7 ½) hours, but will be paid for eight (8) hours, since only one-half (½) hour is allowed for mealtime. When two (2) or more shifts are employed, single time will be paid for each shift. The first 8 hours of any and all work performed Monday through Friday inclusive of any off-shift shall be at the single time rate.

(Local #29)

BOILERMAKER

Boilermaker

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: **\$49.47**

Supplemental Benefit Rate per Hour: **\$39.78**

Supplemental Note: The above rate applies to repair or maintenance and new construction; For time and one half overtime - \$59.08; For double overtime - \$78.37.

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: **\$50.45**

Supplemental Benefit Rate per Hour: **\$41.31**

Supplemental Note: The above rate applies to repair or maintenance and new construction; For time and one half overtime - \$61.37; For double overtime - \$81.43.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

Overtime rates to be paid outside the regular scheduled work day.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$48.08

Supplemental Benefit Rate per Hour: \$41.10

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Off shift work, commencing between 5:00 P.M. and 10:00 P.M. shall work eight and one half hours allowing for one half hour for lunch, but will be paid for 9 hours including benefits at the straight time rate for 8 hours.

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Cement & Concrete Worker

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.33

Supplemental Benefit Rate per Hour: \$26.17

Supplemental Note: \$28.92 on Saturdays; \$31.67 on Sundays & Holidays

Overtime Description

Time and one half the regular rate after 7 hour day (time and one half the regular rate after an 8 hour day when working with Dockbuilders on pile cap forms and for work below street level to the top of the foundation wall, not to exceed 2 feet or 3 feet above the sidewalk-brick shelf, when working on the foundation and structure.)

Overtime

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

1/2 day before Christmas Day

1/2 day before New Year's Day

Shift Rates

On shift work extending over a twenty-four hour period, all shifts are paid at straight time.

(Cement Concrete Workers District Council)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$28.60

Supplemental Benefit Rate per Hour: \$19.75

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$25.74

Supplemental Benefit Rate per Hour: \$19.75

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$22.88

Supplemental Benefit Rate per Hour: \$19.75

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$20.02

Supplemental Benefit Rate per Hour: \$19.75

Overtime Description

Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Shift Rates

The shift day shall be the continuous eight and one-half (8½) hours from 6:00 A.M. to 2:30 P.M. and from 2:30 P.M. to 11:00 P.M., including one-half (½) hour of employees regular rate of pay for lunch. When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive seventy-five cents (\$0.75) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$44.97

Diver Tender (Marine)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.05

Supplemental Benefit Rate per Hour: \$44.97

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$46.82

Supplemental Benefit Rate per Hour: \$44.97

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$39.11**

Supplemental Benefit Rate per Hour: **\$40.20**

Note: For time and one half overtime Wage Rate - \$58.01; for double time overtime Wage Rate - \$77.34

Driver - Boom Truck

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$39.36**

Supplemental Benefit Rate per Hour: **\$40.20**

Note: For time and one half overtime Wage Rate - \$58.01; for double time overtime Wage Rate - \$77.34

Overtime Description

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay. For Thanksgiving week, the prorated share shall be 5 1/3 hours of holiday pay for each day worked in Thanksgiving week.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Driver - Redi-Mix Driver (Sand & Gravel)

Effective Period: 7/1/2013 - 6/30/2014

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$53.00

Supplemental Benefit Rate per Hour: \$47.54

Electrician "A" (Regular Day Overtime)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$78.00

Supplemental Benefit Rate per Hour: \$49.39

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$79.50

Supplemental Benefit Rate per Hour: \$50.86

Electrician "A" (Day Shift)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$52.00

Supplemental Benefit Rate per Hour: \$46.13

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$53.00

Supplemental Benefit Rate per Hour: \$47.54

Electrician "A" (Day Shift Overtime After 8 hours)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$78.00

Supplemental Benefit Rate per Hour: \$49.39

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$79.50

Supplemental Benefit Rate per Hour: \$50.86

Electrician "A" (Swing Shift)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$61.01

Supplemental Benefit Rate per Hour: \$52.47

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$62.19

Supplemental Benefit Rate per Hour: \$54.07

Electrician "A" (Swing Shift Overtime After 7.5 hours)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$91.52

Supplemental Benefit Rate per Hour: \$56.30

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate.

Electrician "M" (First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: **\$26.50**

Supplemental Benefit Rate per Hour: **\$19.56**

First and Second Year "M" Wage Rate Per Hour - Hired on or before 5/10/07: \$25.80

First and Second Year "M" Supplemental Rate- Hired on or before 5/10/07: \$19.21

First and Second Year "M" Wage Rate Per Hour - Hired after 5/10/07: \$22.00

First and Second Year "M" Supplemental Rate- Hired after 5/10/07: \$17.30

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: **\$27.00**

Supplemental Benefit Rate per Hour: **\$20.32**

First and Second Year "M" Wage Rate Per Hour - Hired on or before 5/10/07: \$26.30

First and Second Year "M" Supplemental Rate- Hired on or before 5/10/07: \$19.96

First and Second Year "M" Wage Rate Per Hour - Hired after 5/10/07: \$22.50

First and Second Year "M" Supplemental Rate- Hired after 5/10/07: \$18.06

Electrician "M" (Overtime After First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: **\$39.75**

Supplemental Benefit Rate per Hour: **\$21.23**

First and Second Year "M" Wage Rate Per Hour - Hired on or before 5/10/07: \$38.70

First and Second Year "M" Supplemental Rate- Hired on or before 5/10/07: \$20.83

First and Second Year "M" Wage Rate Per Hour - Hired after 5/10/07: \$33.00

First and Second Year "M" Supplemental Rate- Hired after 5/10/07: \$18.68

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: **\$40.50**

Supplemental Benefit Rate per Hour: **\$21.01**

First and Second Year "M" Wage Rate Per Hour - Hired on or before 5/10/07: \$39.45

First and Second Year "M" Supplemental Rate- Hired on or before 5/10/07: \$21.61

First and Second Year "M" Wage Rate Per Hour - Hired after 5/10/07: \$33.75

First and Second Year "M" Supplemental Rate- Hired after 5/10/07: \$19.47

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:00 A.M.

Vacation

At least 1 year of employment.....ten (10) days
5 years or more of employment.....fifteen (15) days
10 years of employment.....twenty (20) days
Plus one Personal Day per year

Sick Days:
One day per Year

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2013 - 5/20/2014
Wage Rate per Hour: \$52.00
Supplemental Benefit Rate per Hour: \$47.90

Effective Period: 5/21/2014 - 6/30/2014
Wage Rate per Hour: \$53.00
Supplemental Benefit Rate per Hour: \$49.34

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2013 - 5/20/2014
Wage Rate per Hour: \$39.42
Supplemental Benefit Rate per Hour: \$36.46

Effective Period: 5/21/2014 - 6/30/2014
Wage Rate per Hour: \$40.18
Supplemental Benefit Rate per Hour: \$37.73

Electrician - Electro Pole Maintainer

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 7:00 am shall be paid time and one half.

Overtime

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation

Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$45.14

Supplemental Benefit Rate per Hour: \$33.02

Overtime Description

For Service Work: Double time - all work performed on Sundays, Holidays, and between midnight and 7:00am.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Engineer - Heavy Construction Operating Engineer III

Minor Equipment such as Tractors, Post Hole Diggers, Ditch Witch (Walk Behind), Road Finishing Machines, Rollers five tons and under, Tugger Hoists, Dual Purpose Trucks, Fork Lifts, and Dempsey Dumpers, Fireperson.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$56.22

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

Shift Wage Rate: \$89.95

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling and Manning of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$58.97

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

Shift Wage Rate: \$94.35

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$77.30

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

Shift Wage Rate: \$123.68

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$39.10

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

Shift Wage Rate: \$62.56

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$40.84

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

Shift Wage Rate: \$65.34

Overtime Description

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$54.04

Supplemental Benefit Rate per Hour: \$31.93

Supplemental Note: \$57.46 on overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Shift Rates

Off Shift: double time the regular hourly rate.

(Local #15)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$35.55**

Supplemental Benefit Rate per Hour: **\$17.65**

Instrument Person

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$29.41**

Supplemental Benefit Rate per Hour: **\$17.65**

Rodperson

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$25.54**

Supplemental Benefit Rate per Hour: **\$17.65**

Overtime Description

Overtime Benefit Rate - \$23.63 per hour (time & one half) \$29.95 per hour (double time).

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

ENGINEER - FIELD (HEAVY CONSTRUCTION)
(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations,
Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$62.61

Supplemental Benefit Rate per Hour: \$30.62

Supplemental Note: Overtime benefit rate - \$42.73 per hour (time & one half), \$54.84 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$46.00

Supplemental Benefit Rate per Hour: \$30.62

Supplemental Note: Overtime benefit rate - \$42.73 per hour (time & one half), \$54.84 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$38.61

Supplemental Benefit Rate per Hour: \$30.62

Supplemental Note: Overtime benefit rate - \$42.73 per hour (time & one half), \$54.84 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$67.70

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$108.32

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$70.10

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: 51.75 overtime hours

Shift Wage Rate: \$112.16

Operating Engineer - Road & Heavy Construction III

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$72.34

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$115.74

Operating Engineer - Road & Heavy Construction IV

Gradealls, Keystones, Cranes on land or water (with digging buckets), Bridge Cranes, Vermeer Cutter and machines of a similar nature, Trenching Machines.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$70.63

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$113.01

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (employing Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$69.23

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$110.77

Operating Engineer - Road & Heavy Construction VI

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Compressors (Portable 3 or more in battery), Driving of Truck Mounted Compressors, Well-point Pumps, Tugger Machines Well Point Pumps, Churn Drill.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$44.63

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$71.41

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$66.45

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$106.32

Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$64.34

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$102.94

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$61.53

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$98.45

Operating Engineer - Road & Heavy Construction XV

Compressors (Portable Single or two in Battery, not over 100 feet apart), Pumps (River Cofferdam) and Welding Machines, Push Button Machines, All Engines Irrespective of Power (Power-Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$41.44

Supplemental Benefit Rate per Hour: \$28.60

Supplemental Note: \$51.75 overtime hours

Shift Wage Rate: \$66.30

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$54.17**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: **\$51.75** overtime hours

Shift Wage Rate: **\$86.67**

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$70.32**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: **\$51.75** overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$41.76**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: **\$51.75** overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$56.16**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: **\$51.75** overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$73.37**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: **\$51.75** overtime hours

Shift Wage Rate: **\$117.39**

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes, Fork Lifts and Boom Trucks.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$65.83**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: \$51.75 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$69.74**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: \$51.75 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$64.26**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: \$51.75 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$63.58**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: \$51.75 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$50.53**

Supplemental Benefit Rate per Hour: **\$28.60**

Supplemental Note: \$51.75 overtime hours

For New House Car projects started after 7/1/11 only: Wage Rate per Hour \$40.31

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

For House Cars and Rack & Pinion only: Overtime paid at time and one-half for all hours in excess of eight hours in a day, Saturday, Sunday and Holidays worked.

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Two shifts may be utilized with the first shift working 8:00 A.M. to the end of the shift at the straight time of pay. The second shift will receive one hour at double time rate for the last hour of the shift. (eight for seven, nine for eight).

(Carpenters District Council)

GLAZIER

(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2013 - 10/31/2013

Wage Rate per Hour: **\$42.00**

Supplemental Benefit Rate per Hour: **\$33.24**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$41.24**

Effective Period: 11/1/2013 - 6/30/2014

Wage Rate per Hour: **\$42.00**

Supplemental Benefit Rate per Hour: **\$34.09**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$42.59**

Overtime Description

An optional 8th hour can be worked at straight time rate. If 9th hour is worked, then both hours or more (8th & 9th or more) will be at the double time rate of pay.

Overtime

Double time the regular rate after a 7 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Local #1281)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$56.48

Supplemental Benefit Rate per Hour: \$33.31

Overtime Description

Double time shall be paid for supplemental benefits during overtime work.
8th hour paid at time and one half.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Triple time the regular rate for work on the following holiday(s).

Labor Day

Paid Holidays

None

Shift Rates

The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium.

Off hour work in occupied or retail buildings may be worked on weekdays with an increment of \$1.00 per hour and eight hours pay for seven (7) hours worked. Double time will apply for over seven (7) hours worked on weekdays, weekends or holidays.

(Local #12)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.30

Supplemental Benefit Rate per Hour: \$43.54

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

Time and one half the regular rate after a 7 hour day for a maximum of two hours on any regular work day (the 8th and 9th hour) and double time shall be paid for all work on a regular work day thereafter, time and one half the regular rate for Saturday for the first seven hours of work and double time shall be paid for all work on a Saturday thereafter.

Overtime

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

For off shift work - 8 hours pay for 7 hours of work. When two or three shifts are employed on a job, Monday through Friday, the workday for each shift shall be seven hours and paid for ten and one-half hours at the single time rate. When two or three shifts are worked on Saturday, Sunday or holidays, each shift shall be seven hours and paid fifteen and three-quarters hours.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$46.75

Supplemental Benefit Rate per Hour: \$62.48

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LANDSCAPING

(Landscaping tasks, as well as tree pruning, tree removing, spraying and maintenance in connection with the planting of street trees and the planting of trees in city parks but not when such activities are performed as part of, or in connection with, other construction or reconstruction projects.)

Landscaper (Above 6 years experience)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$24.25
Supplemental Benefit Rate per Hour: \$12.30

Landscaper (3 - 6 years experience)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$23.25
Supplemental Benefit Rate per Hour: \$12.30

Landscaper (up to 3 years experience)

Effective Period: 7/1/2013 - 6/30/2014

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$49.19**

Supplemental Benefit Rate per Hour: **\$32.24**

Marble Finisher

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$39.05**

Supplemental Benefit Rate per Hour: **\$31.43**

Marble Polisher

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$34.73**

Supplemental Benefit Rate per Hour: **\$24.60**

Overtime Description

Supplemental Benefit contributions are to be made at the applicable overtime rates. Time and one half the regular rate after a 7 hour day or time and one half the regular rate after an 8 hour day - chosen by Employer at the start of the project and then would last for the full duration of the project.

Overtime

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

(Local #7)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$19.77**

Mason Tender Tier B

On Interior Demolition job sites 33 1/3 % of the employees shall be classified as Tier A Interior Demolition Workers and 66 2/3 % shall be classified as Tier B Interior Demolition Workers; provided that the employer may employ more than 33 1/3 % Tier A Interior Demolition Workers on the job site. Where the number of employees on a job site is not divisible by 3, the first additional employee (above the number of employees divisible by three) shall be a Tier B Interior Demolition Worker, and the second additional employee shall be a Tier A Interior Demolition Worker.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$23.27**

Supplemental Benefit Rate per Hour: **\$14.08**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$41.43**

Supplemental Benefit Rate per Hour: **\$40.15**

Supplemental Note: Supplemental benefits for overtime are paid at the appropriate overtime rate.

Overtime Description

Overtime would be time and one half the regular rate after a seven (7) or eight (8) hours workday, which would be set at the start of the job.

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

The first shift shall receive the straight time rate of pay. The second shift receives the straight time rate of pay plus fifteen (15%) per cent. Members of the second shift shall be allowed one half hour to eat, with this time being included in the hours of the workday established. There must be a first shift to work a second shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) per cent for weekday hours.

(Local #740)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$44.39

Supplemental Benefit Rate per Hour: \$35.11

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.08 per hour.

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.78

Supplemental Benefit Rate per Hour: \$35.11

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.08 per hour.

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.78

Supplemental Benefit Rate per Hour: \$35.11

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$46.08 per hour.

Overtime

Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

(District Council of Painters #9)

PAINTER - SIGN

Designer

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$36.15

Supplemental Benefit Rate per Hour: \$9.66

Journey person

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$33.62

Supplemental Benefit Rate per Hour: \$9.66

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

receive five weeks vacation. Vacation must be taken during winter months. 2 Personal Days except employees hired after 4/1/12 who do not have 2 years of service.

(Local #917)

PAINTER - STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$47.00

Supplemental Benefit Rate per Hour: \$32.08

Painter - Power Tool

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$53.00

Supplemental Benefit Rate per Hour: \$32.08

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

Regular hourly rates plus a ten per cent (10%) differential

(Local #806)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2013 - 4/30/2014

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

and repair of temporary construction fencing; slurry seal coating, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$39.67

Supplemental Benefit Rate per Hour: \$33.55

Production Paver & Roadbuilder - Screed Person

(Production paving is asphalt paving when using a paving machine or on a project where a paving machine is traditionally used)

Adjustment of paving machinery on production paving jobs.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$45.12

Supplemental Benefit Rate per Hour: \$33.55

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$44.61

Supplemental Benefit Rate per Hour: \$33.55

Production Paver & Roadbuilder - Shoveler

General laborer (except removal of surfaces - see Paver and Roadbuilder-Laborer) including but not limited to tamper, AC paint and liquid tar work.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$41.32

Supplemental Benefit Rate per Hour: \$33.55

Overtime Description

Veteran's Day is a Paid Holiday for employees working on production paving.

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

Employees who work on a holiday listed below receive the straight time rate plus one day's pay for the holiday.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Paid Holidays

Memorial Day

Independence Day

Labor Day

Presidential Election Day

Thanksgiving Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

The second shift shall start at a time between 3:30 p.m. and 7:00 p.m. and shall consist of seven (7) working hours and shall receive eight (8) hours of wages and benefits at the straight time rate. The workers on the second shift shall be allowed one-half (½) hour to eat with this time being included in the seven (7) hours of work.

(Local #530)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$35.00**

Supplemental Benefit Rate per Hour: **\$25.74**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Presidential Election Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

When work commences outside regular work hours, workers receive an hour additional (differential) wage and supplement payment. Eight hours pay for seven hours work or nine hours pay for eight hours work.

(Mason Tenders District Council)

PLUMBER

Plumber

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Plumbers Local # 1)

**PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME
CONSTRUCTION)**

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$37.11

Supplemental Benefit Rate per Hour: \$25.56

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday.

50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$45.41

Supplemental Benefit Rate per Hour: \$23.29

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:30 P.M.) is to be paid at time and one half the regular rate.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$39.00

Supplemental Benefit Rate per Hour: \$27.37

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Bricklayer District Council)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$45.96**

Supplemental Benefit Rate per Hour: **\$43.19**

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$12.90**

Supplemental Benefit Rate per Hour: **\$8.07**

Sheet Metal Worker - Fan Maintenance

(The temporary operation of fans or blowers in new or existing buildings for heating and/or ventilation, and/or air conditioning prior to the completion of the project.)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$36.77**

Supplemental Benefit Rate per Hour: **\$43.19**

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Paid Holidays

None

(Local #28)

SIGN ERECTOR

(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.80

Supplemental Benefit Rate per Hour: \$42.17

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Shift Rates

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter I

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$52.50

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

May be performed outside of the regular workday except Saturday, Sunday and Holidays. A shift shall consist of eight working hours. All work performed in excess of eight hours shall be paid at double time. No shift shall commence after 7:00 P.M. on Friday or 7:00 P.M. the day before holidays. All work performed after 12:01 A.M. Saturday or 12:01 A.M. the day before a Holiday will be paid at double time. When shift work is performed the wage rate for regular time worked is a thirty percent premium together with fringe benefits.

On Transit Authority projects, where work is performed in the vicinity of tracks all shift work on weekends and holidays may be performed at the regular shift rates.

Local #638

**STEAMFITTER - REFRIGERATION AND AIR CONDITIONER
(Maintenance and Installation Service Person)**

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$36.30

Supplemental Benefit Rate per Hour: \$11.76

Refrigeration and Air Conditioner Service Person V

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$29.82

Supplemental Benefit Rate per Hour: \$10.71

Refrigeration and Air Conditioner Service Person IV

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$24.71

Supplemental Benefit Rate per Hour: \$9.80

Refrigeration and Air Conditioner Service Person III

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Local #638B)

STONE MASON - SETTER

Stone Mason - Setters

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$47.72

Supplemental Benefit Rate per Hour: \$35.28

Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

Washington's Birthday

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates

For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$44.32

Supplemental Benefit Rate per Hour: \$21.66

Effective Period: 1/1/2014 - 6/24/2014

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$38.49

Supplemental Benefit Rate per Hour: \$27.40

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$42.63

Supplemental Benefit Rate per Hour: \$44.54

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Time and one half the regular hourly rate after 40 hours in any work week.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work, commencing between 5:00 P.M. and 11:00 P.M., shall work eight and one half hours allowing for one half hour for lunch but will be paid 113% of the straight time hourly wage and the straight time supplemental benefits.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$49.48

Supplemental Benefit Rate per Hour: \$44.06

All Others (Free Air Rates)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$45.73

Supplemental Benefit Rate per Hour: \$40.75

Microtunneling (Free Air Rates)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$39.58

Supplemental Benefit Rate per Hour: \$35.25

Overtime Description

For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, or for Saturday, or for Sunday. Double time the regular rate for work on a holiday.

For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.

Overtime

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

(Local #147)

WELDER

**TO BE PAID AT THE RATE OF THE JOURNEYPEPERSON IN THE TRADE
PERFORMING THE WORK.**

OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

APPENDIX

Pursuant to Labor Law §220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be employed on a public work project.

Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the journey person wage rate for the classification of work he actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

ASBESTOS HANDLER

(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Asbestos Handler (First 1000 Hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 78% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$15.05

Asbestos Handler (Second 1000 Hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$15.05

Asbestos Handler (Third 1000 Hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 83% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$15.05

Asbestos Handler (Fourth 1000 Hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 89% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$15.05

(Local #78)

BOILERMAKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$28.75

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$29.74

Boilermaker (Second Year: 1st Six Months)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$38.20

Effective Period: 1/1/2014 - 6/30/2014
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$39.65

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$16.60

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 95% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Cement Mason (Second Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Cement Mason (Third Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 70% of Journeyperson's Rate

(Local #780)

CEMENT AND CONCRETE WORKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (0 - 500 hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$18.04

Cement & Concrete Worker (501 - 1000 hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$18.87

Cement & Concrete Worker (1001 - 2000 hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$24.25

Cement & Concrete Worker (2001 - 4000 hours)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$25.07

(Cement Concrete Workers District Council)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate Per Hour: \$30.29

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$30.29

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$30.29

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Year - Hired before 5/10/07)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$15.25

Supplemental Benefit Rate per Hour: \$12.26

Overtime Wage Rate Per Hour: \$22.88

Overtime Supplemental Rate Per Hour: \$13.26

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$15.25

Supplemental Benefit Rate per Hour: \$12.51

Overtime Wage Rate Per Hour: \$22.88

Overtime Supplemental Rate Per Hour: \$13.51

Electrician (First Year - Hired on or After 5/10/07)

Effective Period: 7/1/2013 - 5/13/2014

Wage Rate per Hour: \$12.50

Supplemental Benefit Rate per Hour: \$10.86

Overtime Wage Rate Per Hour: \$18.75

Overtime Supplemental Rate Per Hour: \$11.68

Effective Period: 5/14/2014 - 6/30/2014

Wage Rate per Hour: \$12.50

Supplemental Benefit Rate per Hour: \$11.11

Overtime Wage Rate Per Hour: \$18.75

Overtime Supplemental Rate Per Hour: \$11.93

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 5/14/2014 - 6/30/2014
Wage Rate per Hour: \$16.50
Supplemental Benefit Rate per Hour: \$13.14
Overtime Wage Rate Per Hour: \$24.75
Overtime Supplemental Rate Per Hour: \$14.23

Electrician (Fourth Year - Hired before 5/10/07)

Effective Period: 7/1/2013 - 5/13/2014
Wage Rate per Hour: \$22.10
Supplemental Benefit Rate per Hour: \$15.74
Overtime Wage Rate Per Hour: \$33.15
Overtime Supplemental Rate Per Hour: \$17.20

Effective Period: 5/14/2014 - 6/30/2014
Wage Rate per Hour: \$22.10
Supplemental Benefit Rate per Hour: \$15.99
Overtime Wage Rate Per Hour: \$33.15
Overtime Supplemental Rate Per Hour: \$17.45

Electrician (Fourth Year - Hired on or After 5/10/07)

Effective Period: 7/1/2013 - 5/13/2014
Wage Rate per Hour: \$18.50
Supplemental Benefit Rate per Hour: \$13.91
Overtime Wage Rate Per Hour: \$27.75
Overtime Supplemental Rate Per Hour: \$15.13

Effective Period: 5/14/2014 - 6/30/2014
Wage Rate per Hour: \$18.50
Supplemental Benefit Rate per Hour: \$14.16
Overtime Wage Rate Per Hour: \$27.75
Overtime Supplemental Rate Per Hour: \$15.38

Electrician (Fifth Year - Hired before 5/10/07)

Effective Period: 7/1/2013 - 5/13/2014
Wage Rate per Hour: \$25.80
Supplemental Benefit Rate per Hour: \$19.21
Overtime Wage Rate Per Hour: \$38.70
Overtime Supplemental Rate Per Hour: \$20.83

Effective Period: 5/14/2014 - 6/30/2014
Wage Rate per Hour: \$26.30
Supplemental Benefit Rate per Hour: \$19.96
Overtime Wage Rate Per Hour: \$39.45
Overtime Supplemental Rate Per Hour: \$21.61

Electrician (Fifth Year - Hired on or After 5/10/07)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Per Hour: \$26.79

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 55% of Journeyperson's rate

Supplemental Benefit Per Hour: \$27.12

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Per Hour: \$28.43

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Benefit Per Hour: \$29.74

(Local #1)

ENGINEER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$22.49

Supplemental Benefit Rate per Hour: \$20.68

FLOOR COVERER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Second Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Third Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyman's rate

Supplemental Rate Per Hour: \$25.75

Floor Coverer (Fourth Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Rate Per Hour: \$25.75

(Carpenters District Council)

GLAZIER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$11.97

Glazier (Second Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$21.13

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$20.36

Supplemental Benefit Rate per Hour: \$16.35

House Wrecker - Second Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$21.46

Supplemental Benefit Rate per Hour: \$16.35

House Wrecker - Third Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$23.01

Supplemental Benefit Rate per Hour: \$16.35

House Wrecker - Fourth Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$25.36

Supplemental Benefit Rate per Hour: \$16.35

(Local #79)

IRON WORKER - ORNAMENTAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - 1st Four Months - Hired on or Before 8/1/08

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 60% of Journeyperson's rate

Supplemental Rate Per Hour: \$35.78

Iron Worker (Ornamental) 5 - 10 Months - Hired on or Before 8/1/08

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Rate Per Hour: \$36.75

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$39.66

(Local #580)

IRON WORKER - STRUCTURAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$24.48
Supplemental Benefit Rate per Hour: \$43.87

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$25.08
Supplemental Benefit Rate per Hour: \$43.87

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$25.68
Supplemental Benefit Rate per Hour: \$43.87

(Local #40 and #361)

LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE LAYER & COMMON)

(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First 1000 hours

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: \$33.25

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Polishers & Finishers - Third 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Polishers & Finishers - Fourth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

MASON TENDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$20.63

Supplemental Benefit Rate per Hour: \$17.06

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$17.71
Supplemental Benefit Rate per Hour: \$19.85

Metallic Lather (Second Year - Called On Or After 6/29/11)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$22.81
Supplemental Benefit Rate per Hour: \$19.85

Metallic Lather (Third Year - Called On Or After 6/29/11)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$27.91
Supplemental Benefit Rate per Hour: \$19.85

(Local #46)

MILLWRIGHT

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$26.23
Supplemental Benefit Rate per Hour: \$31.51

Millwright (Second Year)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$31.00
Supplemental Benefit Rate per Hour: \$34.77

Millwright (Third Year)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$35.77
Supplemental Benefit Rate per Hour: \$39.19

Millwright (Fourth Year)

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate per Hour: \$45.30

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 5/1/2014 - 6/30/2014

Wage Rate per Hour: \$19.75

Supplemental Benefit Rate per Hour: \$15.73

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2013 - 4/30/2014

Wage Rate per Hour: \$22.50

Supplemental Benefit Rate per Hour: \$18.14

Effective Period: 5/1/2014 - 6/30/2014

Wage Rate per Hour: \$23.70

Supplemental Benefit Rate per Hour: \$18.64

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2013 - 4/30/2014

Wage Rate per Hour: \$30.00

Supplemental Benefit Rate per Hour: \$23.52

Effective Period: 5/1/2014 - 6/30/2014

Wage Rate per Hour: \$31.60

Supplemental Benefit Rate per Hour: \$24.02

(District Council of Painters)

PAINTER - STRUCTURAL STEEL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

PLUMBER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$14.00**

Supplemental Benefit Rate per Hour: **\$0.71**

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$14.00**

Supplemental Benefit Rate per Hour: **\$2.96**

Plumber - Second Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$17.96**

Supplemental Benefit Rate per Hour: **\$16.25**

Plumber - Third Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$20.06**

Supplemental Benefit Rate per Hour: **\$16.25**

Plumber - Fourth Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$22.91**

Supplemental Benefit Rate per Hour: **\$16.25**

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$24.31**

Supplemental Benefit Rate per Hour: **\$16.25**

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$36.38**

Supplemental Benefit Rate per Hour: **\$16.25**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Roofer - Second Year

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Roofer - Third Year

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Roofer - Fourth Year

Effective Period: 7/1/2013 - 6/30/2014

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's Rate

(Local #8)

SHEET METAL WORKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker - First Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 30% of Journeyperson's rate

Supplemental Rate Per Hour: \$15.37

Sheet Metal Worker - Second Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 35% of Journeyperson's rate

Supplemental Rate Per Hour: \$18.24

Sheet Metal Worker - Third Year (1st Six Months)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Rate Per Hour: \$20.06

Sheet Metal Worker - Third Year (2nd Six Months)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 45% of Journeyperson's rate

Supplemental Rate Per Hour: \$21.87

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$8.34

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$9.13

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$9.92

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Rate Per Hour: \$10.72

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$11.51

Sign Erector - Fifth Year

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$12.30

Sign Erector - Sixth Year

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Rate Per Hour: \$12.30

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2013 - 6/30/2014
Wage Rate Per Hour: 100% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

TAPER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2013 - 6/30/2014
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Drywall Taper - Second Year

Effective Period: 7/1/2013 - 6/30/2014
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Drywall Taper - Third Year

Effective Period: 7/1/2013 - 6/30/2014
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1974)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Rate Per Hour: \$30.04

Timberperson - Second Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$30.04

Timberperson - Third Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Rate Per Hour: \$30.04

Timberperson - Fourth Year

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: \$30.04

(Local #1536)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

LABOR LAW § 230 AND NYC ADMINISTRATIVE CODE § 6-130
BUILDING SERVICE EMPLOYEES

PREVAILING WAGE FOR BUILDING SERVICE EMPLOYEES ON NYC CONTRACTS PURSUANT TO
LABOR LAW § 230 ET-SEQ.

Building service employees on public contracts must receive not less than the prevailing rate of wage and supplements for the classification of work performed. In accordance with Labor Law §230 et seq. the Comptroller of the City of New York has promulgated this schedule of prevailing wages and supplemental benefits for building service employees engaged on New York City public building service contracts in excess of \$1,500.00. Prevailing rates are required to be annexed to and form part of the contract pursuant to §231 (4).

Contracting agencies that anticipate doing work that may require building service trades or classifications not included in this schedule may request the Comptroller to establish a proper classification and wage determination for the work. Contractors using trades and/or classifications for which the Comptroller has not promulgated wages and benefits do so at their own risk.

Contractors are advised to review the applicable Comptroller's Prevailing Wage Schedule before bidding on public work. Any Prevailing Wage Rate error made by the Contracting Agency, whether in a contract document or other communication, will not preclude a finding against the contractor of a prevailing wage violation.

PREVAILING WAGE FOR BUILDING SERVICE EMPLOYEES IN NEW YORK CITY LEASED OR
FINANCIALLY ASSISTED FACILITIES PURSUANT TO NYC ADMINISTRATIVE CODE § 6-130

Covered landlords & covered financial assistance recipients shall ensure that all building service employees performing building service work at the premises to which a lease or financial assistance pertains are paid no less than the prevailing wage listed in the Labor Law §230 Prevailing Wage Schedule.

Covered Landlords include:

Businesses (other than not-for-profit organizations) leasing to New York City agencies commercial office space or commercial office facilities of 10,000 square feet or more where the City leases or rents no less than 51% of the total square footage of the building to which the lease applies (no less than 80% in Staten Island or in an area not defined as an exclusion area pursuant to section 421-a of the real property tax law on the date of enactment of the local law).

Covered Financial Assistance Recipients include:

Businesses (other than not-for-profit organizations) with annual gross revenues of five million dollars or more who have received financial assistance from the City of New York (as defined in New York City Administrative Code §6-130) with a total value of one million dollars or more.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE



Office of the Comptroller
BUREAU OF LABOR LAW

CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
JOHN C. LIU

BUREAU OF LABOR LAW

MUNICIPAL BUILDING
ONE CENTRE STREET, ROOM 1120
NEW YORK, N.Y. 10007-2341

TEL: (212) 669-4443
FAX: (212) 669-4002

If you are a Covered Building Service Employee and you have been paid less than the Prevailing Wage and Benefits, please contact us at 212-669-4443 or download our complaint form from our website at WWW.COMPTROLLER.NYC.GOV (click on the Bureau of Labor Law).

Si es un empleado de servicios a edificios elegible y recibió menos del sueldo prevalente y beneficios, por favor contáctenos en 212-669-4443 o descarga un formulario de reclamo del sitio del Internet WWW.COMPTROLLER.NYC.GOV (opreme "Oficina de Derecho Laboral").

Wasył Kinach, P.E.
Director of Classifications
Bureau of Labor Law

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

BOILER SERVICEPERSON/TANK CLEANER MECHANIC (LOW PRESSURE)

Boiler Service Person/Tank Cleaner Mechanic (Low Pressure)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$11.37

Supplemental Benefit Rate per Hour: \$5.57

Overtime Description

Work in excess of 8 hours performed on a Sunday or Holiday shall be paid two and one half times the regular rate.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Employee's Birthday

Vacation

1 year service.....five (5) days

3 years service or more.....ten (10) days

8 years service or more.....fifteen (15) days

13 years service or more.....twenty (20) days

SICK LEAVE:

1-2 years employment.....4 days

2-3 years employment.....5 days

3-4 years employment.....6 days

4-5 years employment.....8 days

6 years or more employment.....10 days

(Local #32 B/J)

BUILDING CLEANER AND MAINTAINER (OFFICE)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Office Building Class "B" Handyperson (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$25.07

Supplemental Benefit Rate per Hour: \$9.51

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$25.52

Supplemental Benefit Rate per Hour: \$9.91

Office Building Class "B" Foreperson, Starter (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$24.95

Supplemental Benefit Rate per Hour: \$9.51

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$25.40

Supplemental Benefit Rate per Hour: \$9.91

Office Building Class "B" Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director (Over 120,000 and less than 280,000 square feet gross area)

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$22.94

Supplemental Benefit Rate per Hour: \$9.51

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director may be paid 75% of the wage rate above for the first 21 months of employment, 85% of the wage rate above for the 22nd through 42nd months of employment, and upon the completion of 42 months of employment employee shall be paid the full wage rate. Note: New Hires hired before January 1, 2012 will continue to receive 80% of the wage rate above for the first 30 months, and upon the completion of 30 months of employment employee shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$23.39

Supplemental Benefit Rate per Hour: \$9.91

Supplemental Note: for new employee 0-12 months of employment - \$7.22; for new employee 13-24 months of employment - \$9.58

NEW HIRE: Cleaner/Porter, Elevator Operator, Exterminator, Fire Safety Director may be paid 75% of the wage rate above for the first 21 months of employment, 85% of the wage rate above for the 22nd through 42nd months of employment, and upon the completion of 42 months of employment employee shall be paid the full wage rate. Note: New Hires hired before January 1, 2012 will continue to receive 80% of the wage rate above for the first 30 months, and upon the completion of 30 months of employment employee shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for work on a holiday plus the day's pay.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Vacation

Less than 6 months of work.....no vacation

6 months of work.....three (3) days

1 year of work.....ten (10) days

5 years of work.....fifteen (15) days

15 years of work.....twenty (20) days

21 years of work.....twenty-one (21) days

22 years of work.....twenty-two (22) days

23 years of work.....twenty-three (23) days

24 years of work.....twenty-four (24) days

25 years or more of work.....twenty-five (25) days

Plus two Personal Days per year.

Sick Leave:

10 sick days per year.

Unused sick leave paid in the succeeding January, one full day pay for each unused sick day.

(Local #32 B/J)

BUILDING CLEANER AND MAINTAINER (RESIDENTIAL)

Residential Building Class "A" Handyperson

Residential Buildings Class "A": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of over \$4000.00 a room.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$23.57

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: Effective 1/1/2014 - \$9.83

Residential Building Class "A" Cleaner/Porter

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$21.28

Supplemental Benefit Rate per Hour: \$9.83

Supplemental Note: for new employee 0-12 months of employment - \$7.22; for new employee 13-24 months of employment - \$9.58

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Residential Building Class "C" Handyperson

Residential Building Class "C": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of \$2000.00 or less a room.

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$23.45

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: Effective 1/1/2014 - \$9.83

Residential Building Class "C" Cleaner/Porter

Residential Building Class "C": buildings where the assessed value of the land and building, based upon the 1935 assessment, divided by the number of rooms in the building, gives an assessed value of \$2000.00 or less a room.

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$21.23

Supplemental Benefit Rate per Hour: \$9.43

Supplemental Note: for new employee 0-12 months of employment - \$6.92; for new employee 13-24 months of employment - \$9.18

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$21.23

Supplemental Benefit Rate per Hour: \$9.83

Supplemental Note: for new employee 0-12 months of employment - \$7.22; for new employee 13-24 months of employment - \$9.58

NEW HIRE: Porter/Cleaner, may be paid a starting rate of 80% of the hourly rate published above. Upon completion of 30 months of employment, the new hire shall be paid the full wage rate. Upon completion of two years of employment the new hire receives the full supplemental benefit rate.

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for work on a holiday plus the day's pay.

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$15.97

Overtime Description

All hours worked on a holiday shall be paid at two and one half times the regular wage rate in lieu of the paid day off.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Plus six (6) floating Holidays

Vacation

6 months	three (3) days
1 year	ten (10) days
5 years	fifteen (15) days
15 years	twenty (20) days
21 years.....	twenty-one (21) days
22 years	twenty-two (22) days
23 years	twenty-three (23) days
24 years	twenty-four (24) days
25 years	twenty-five (25) days

(Local #94)

CLEANER (PARKING GARAGE)

Garage Cleaner

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$11.20

Supplemental Benefit Rate per Hour: \$1.72

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular hourly rate after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Veteran's Day

Triple time the regular rate for work on the following holiday(s).

New Year's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Vacation

Less than 75 days worked.....no vacation.
75 days worked, but less than 110 days worked in a calendar year.....five (5) days the following year.
110 days or more worked in a calendar year.....ten (10) days the following year.

SICK LEAVE:

1 day sick leave earned for each 40 days worked in the preceding calendar year for a maximum of five (5) days per calendar year.

(Local #553)

GARDENER

Gardener

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: \$17.16

Supplemental Benefit Rate per Hour: \$1.72

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular hourly rate after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Christmas Day

Vacation

1 year of service but less than five years.....	ten (10) days
5 years of service but less than ten years.....	fifteen (15) days
10 years of service.....	sixteen (16) days
11 years.....	seventeen (17) days
12 years.....	eighteen (18) days
13 years.....	nineteen (19) days
14 years.....	twenty (20) days
20 years.....	twenty-one (21) days
21 years.....	twenty-two (22) days
22 years.....	twenty-three (23) days
23 years.....	twenty-four (24) days
24 years.....	twenty-five (25) days
Plus 5 Personal Days	

(Local #813)

MOVER - OFFICE FURNITURE AND EQUIPMENT

Heavy and Tractor Trailer Truck Driver

Tractor-trailer combination or a truck with a capacity of at least 26,000 pounds Gross Vehicle Weight (GVW)

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$22.57**

Supplemental Benefit Rate per Hour: **\$4.49**

Light Truck Driver

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$19.81**

Supplemental Benefit Rate per Hour: **\$4.49**

Laborer and Freight, Stock, and Material Movers, Hand

Effective Period: 7/1/2013 - 6/30/2014

Wage Rate per Hour: **\$17.51**

Supplemental Benefit Rate per Hour: **\$4.49**

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular hourly rate after 40 hours in any work week.

(Based on data from NYS Department of Labor Occupational Employment Statistics and US Department of Labor Bureau of Labor Statistics)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Personal Day

Vacation

Months on payroll	Vacation with Pay
6	3 days
12	5 days
24	10 days
60	15 days
180	20 days
300	25 days

Sick Leave

Employees accrue paid sick leave at the rate of one (1) sick day for every six (6) months worked, up to a maximum of six (6) days a year.

(Local #32B/J)

SECURITY GUARD (UNARMED)

Security Guard (Unarmed) 0 - 6 months

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$12.85

Supplemental Benefit Rate per Hour: \$4.54

Supplemental Note: for new employee 0-30 days of employment - \$4.26; for new employee 31-120 days of employment - \$4.43

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$13.10

Supplemental Benefit Rate per Hour: \$4.63

Supplemental Note: for new employee 0-30 days of employment - \$4.44; for new employee 31-120 days of employment - \$4.61

Security Guard (Unarmed) 7 - 12 months

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$13.35

Supplemental Benefit Rate per Hour: \$4.54

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$13.60

Supplemental Benefit Rate per Hour: \$4.63

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Personal Day

Vacation

Months on payroll	Vacation with Pay
6	3 days
12	5 days
24	10 days
60	15 days
180	20 days
300	25 days

Sick Leave

Employees accrue paid sick leave at the rate of one (1) sick day for every six (6) months worked, up to a maximum of six (6) days a year.

(Local #32B/J)

WINDOW CLEANER

Window Cleaner

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$26.44

Supplemental Benefit Rate per Hour: \$9.51

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$26.90

Supplemental Benefit Rate per Hour: \$9.91

Power Operated Scaffolds, Manual Scaffolds, and Boatswain Chairs

Effective Period: 7/1/2013 - 12/31/2013

Wage Rate per Hour: \$28.69

Supplemental Benefit Rate per Hour: \$9.51

Effective Period: 1/1/2014 - 6/30/2014

Wage Rate per Hour: \$29.27

Supplemental Benefit Rate per Hour: \$9.91

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§230 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$25.44

Supplemental Benefit Rate per Hour: \$9.91

Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Personal Day

Vacation

After 7 months but less than 1 year of service.....	five (5) days
1 year but less than 5 years of service.....	ten (10) days
5 years of service but less than 15 years of service.....	fifteen (15) days
15 years of service but less than 21 years of service.....	twenty (20) days
21 years.....	twenty-one (21) days
22 years.....	twenty-two (22) days
23 years.....	twenty-three (23) days
24 years.....	twenty-four (24) days
25 years or more of service.....	twenty-five (25) days
Plus 1 day per year for medical visit	

SICK LEAVE:

10 days after one year worked. Unused sick days to be paid in cash.

(Local #32 B/J)

PROJECT LABOR AGREEMENT
COVERING
NEW CONSTRUCTION OF IDENTIFIED
CITY OWNED BUILDINGS AND STRUCTURES

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**PROJECT LABOR AGREEMENT COVERING SPECIFIED
RENOVATION & REHABILITATION OF NEW YORK CITY OWNED
FACILITIES & STRUCTURES**

ARTICLE 1 - PREAMBLE

WHEREAS, the City of New York, acting through the Department of Design and Construction desires to provide for the cost efficient, safe, quality, and timely completion of certain new construction ("Project Work," as defined in Article 3) in a manner designed to afford the lowest costs to the Agency and the Public it represents, and the advancement of permissible statutory objectives;

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia, by:

(1) providing a mechanism for responding to the unique construction needs associated with this Project Work and achieving the most cost effective means of construction, including direct labor cost savings, by the Building and Construction Trades Council of Greater New York and Vicinity and the signatory Local Unions and their members waiving various shift and other hourly premiums and other work and pay practices which would otherwise apply to Project Work;

(2) expediting the construction process and otherwise minimizing the disruption to the covered Agency's ongoing operations at the facilities that are the subject of the Agreement;

(3) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes, reducing jobsite friction on common situs worksites, and promoting labor harmony and peace for the duration of the Project Work;

(4) standardizing the terms and conditions governing the employment of labor on the Project Work;

(5) permitting wide flexibility in work scheduling and shift hours and times to allow maximum work to be done during off hours yet at affordable pay rates;

(6) permitting adjustments to work rules and staffing requirements from those which otherwise might obtain;

(7) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

- (8) ensuring a reliable source of skilled and experienced labor; and
- (9) securing applicable New York State Labor Law exemptions.

WHEREAS, the Building and Construction Trades Council of Greater New York and Vicinity, its participating affiliated Local Unions and their members, desire to assist the City in meeting these operational needs and objectives as well as to provide for stability, security and work opportunities which are afforded by this Project Labor Agreement; and

WHEREAS, the Parties desire to maximize Project Work safety conditions for both workers and the community in the project area.

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into by the New York City Department of Design and Construction, including in its capacity as construction manager of covered projects and/or on behalf of any third party construction manager which may be utilized, and the Building and Construction Trades Council of Greater New York and Vicinity ("Council") (on behalf of itself) and the signatory affiliated Local Union's ("Unions" or "Local Unions"). The Council and each signatory Local Union hereby warrants and represents that it has been duly authorized to enter into this Agreement.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

Throughout this Agreement, the various Union parties including the Building and Construction Trades Council of Greater New York and Vicinity and its participating affiliated Local Unions, are referred to singularly and collectively as "Union(s)" or "Local Unions"; the term "Contractor(s)" shall include any Construction Manager, General Contractor and all other

contractors, and subcontractors of all tiers engaged in Project Work within the scope of this Agreement as defined in Article 3; "Agency" means the New York City Department of Design and Construction (DDC); when the Agency acts as Construction Manager, unless otherwise provided, it has the rights and obligations of a "Construction Manager" in addition to the rights and obligations of the Agency; the Building and Construction Trades Council of Greater New York and Vicinity is referred to as the "Council"; and the work covered by this Agreement (as defined in Article 3) is referred to as "Project Work."

SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

This Agreement shall not become effective unless each of the following conditions are met: the Agreement is executed by (1) the Council, on behalf of itself, (2) the participating affiliated Local Unions; and (3) the commissioner of the Agency or his designee.

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all participating Unions and their affiliates, the Construction Manager (in its capacity as such) and all Contractors of all tiers performing Project Work, as defined in Article 3. The Contractors shall include in any subcontract that they let for performance during the term of this Agreement a requirement that their subcontractors, of all tiers, become signatory and bound by this Agreement with respect to that subcontracted work falling within the scope of Article 3 and all Contractors (including subcontractors) performing Project Work shall be required to sign a "Letter of Assent" in the form annexed hereto as Exhibit "A." This Agreement shall be administered by the Agency or a Construction Manager or such other designee as may be named by the Agency or Construction Manager, on behalf of all Contractors.

SECTION 4. SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements, a list

of which is appended hereto as Schedule A, represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Project Work, in whole or in part, except that Project Work which falls within the jurisdiction of the Operating Engineers Locals 14 and 15 will be performed under the terms and conditions set out in the Schedule A agreements of Operating Engineers Locals 14 and 15, provided further, any work performed that may fall under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, all instrument calibration work and loop checking which shall be performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors, with the exception of the dispute resolution mechanisms and no strike clause contained herein, which shall govern all Project Work. Subject to the foregoing, where a subject covered by the provisions of this Agreement is also covered by a Schedule A agreement, the provisions of this Agreement shall prevail. It is further understood that no Contractor shall be required to sign any other agreement as a condition of performing Project Work. No practice, understanding, or agreement between a Contractor and a Local Union which is not set forth in this Agreement shall be binding on this Project Work unless endorsed in writing by the Agency, its Construction Manager or such other designee as may be designated by the Agency.

SECTION 5. LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Construction Manager and any Contractor shall not be liable for any violations of this Agreement by any other Contractor; and the Council and Local Unions shall not be liable for any violations of this Agreement by any other Union.

SECTION 6. THE AGENCY

The Agency (or Construction Manager where applicable) shall require in its bid specifications for all Project Work within the scope of Article 3 that all successful bidders, and their subcontractors of all tiers, become bound by, and signatory to, this Agreement. The Agency (or Construction Manager) shall not be liable for any violation of this Agreement by any Contractor. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of the Agency or Construction Manager in determining which Contractors shall be awarded contracts for Project Work. It is further understood that the Agency or Construction Manager has sole discretion at any time to terminate, delay or suspend the Project Work, in whole or part, on any Project.

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to, any successful bidder for (or subcontractor of) Project Work who becomes signatory thereto, without regard to whether that successful bidder (or subcontractor) performs work at other sites on either a union or non-union basis and without regard to whether employees of such successful bidder (or subcontractor) are, or are not, members of any unions. This Agreement shall not apply to the work of any Contractor which is performed at any location other than the site of Project Work.

SECTION 8. SUBCONTRACTING

Contractors will subcontract Project Work only to a person, firm or corporation who is or agrees to become party to this Agreement.

ARTICLE 3-SCOPE OF THE AGREEMENT

SECTION 1. WORK COVERED

Project Work shall be limited to construction contracts bid and let by the Agency (or its Construction Manager where applicable) after the effective date of this Agreement for the new construction of the Queens Hospital EMS Station, an emergency medical station to be built on vacant land on the Queens Hospital campus, consisting of a two story building that is approximately 13,000 square feet that is comprised of a 27 space parking lot, ambulance storage, training room, locker room, restrooms, kitchen, office space and a new front side walk with trees ("Project Work").

It is understood that Project Work does not include, and this Project Labor Agreement shall not apply to, any other work, including:

1. Contracts let and work performed under contracts bid by the applicable construction manager prior to the effective date of this Agreement and all contracts let by either the City or the applicable Construction Manager after December 31, 2014;
2. Contracts procured on an emergency basis;
3. Small purchases (purchases not more than \$100,000) awarded pursuant to New York City Charter §314, New York City Charter § 316 and New York City Procurement Policy Board Rules §3-08;
4. Contracts with electric utilities, gas utilities, telephone companies, and railroads, except that it is understood and agreed that these entities may only install their work to a demarcation point, e.g. a telephone closet or utility vault, the location of which is determined prior to construction and employees of such entities shall not be used to replace employees performing Project Work pursuant to this agreement; and
5. Contracts for installation of information technology that is not otherwise

Project Work.

SECTION 2. TIME LIMITATIONS

In addition to falling within the scope of Article 3, Section 1, to be covered by this Agreement Project Work must be (1) advertised and let for bid after the effective date of this Agreement, and (2) let for bid prior to December 31, 2014, the expiration date of this Agreement. It is understood that this Agreement, together with all of its provisions, shall remain in effect for all such Project Work until completion, even if not completed by the expiration date of the Agreement. If Project Work otherwise falling within the scope of Article 3, Section 1 is not let for bid by the expiration date of this Agreement, this Agreement may be extended to that work by mutual agreement of the parties.

SECTION 3. EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing Project Work:

A. Superintendents, supervisors (excluding general and forepersons specifically covered by a craft's Schedule A), engineers, professional engineers and/or licensed architects engaged in inspection and testing, quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, technicians, non-manual employees, and all professional, engineering, administrative and management persons;

B.. Employees of the Agency, New York City, or any other municipal or State agency, authority or entity, or employees of any other public employer, even though working on the Project site while covered Project Work is underway;

C. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components, materials, equipment or machinery or involved in deliveries to and from the Project site, except

to the extent they are lawfully included in the bargaining unit of a Schedule A agreement;

D. Employees of the Construction Manager (except that in the event the Agency engages a Contractor to serve as Construction Manager, then those employees of the Construction Manager performing manual, on site construction labor will be covered by this Agreement);

E. Employees engaged in on-site equipment warranty work unless employees are already working on the site and are certified to perform warranty work;

F. Employees engaged in geophysical testing other than boring for core samples;

G. Employees engaged in laboratory, specialty testing, or inspections, pursuant to a professional services agreement between the Agency, or any of the Agency's other professional consultants, and such laboratory, testing, inspection or surveying firm; and

H. Employees engaged in on-site maintenance of installed equipment or systems which maintenance is awarded as part of a contract that includes Project Work but which maintenance occurs after installation of such equipment or system and is not directly related to construction services.

SECTION 4. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to those parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor which do not perform Project Work. It is agreed that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the Agency (including in its capacity as Construction Manager) or any Contractor. The Agreement shall further not apply to any New York City or other municipal or State agency, authority, or entity other than the Agency and nothing contained herein shall be

construed to prohibit or restrict the Agency or its employees, or any State, New York City or other municipal or State authority, agency or entity and its employees, from performing on or off-site work related to Project Work.

As the contracts involving Project Work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by the Agency (or Construction Manager) for performance under the terms of this Agreement.

ARTICLE 4- UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all employees who are performing on-site Project Work, with respect to that work.

SECTION 2. UNION REFERRAL

A. The Contractors agree to employ and hire craft employees for Project Work covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area collective bargaining agreements. Notwithstanding this, Contractors shall have sole right to determine the competency of all referrals; to determine the number of employees required; to select employees for layoff (subject to Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments. In the event that a Local Union is unable to fill any request for qualified employees within a 48 hour period after such requisition is made by a Contractor (Saturdays, Sundays and holidays excepted), a Contractor may employ qualified applicants from any other available source. In the

event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of craft employees hired for Project Work within its jurisdiction from any source other than referral by the Union.

B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project Work and who meet the following qualifications:

- (1) possess any license required by New York State law for the Project Work to be performed;
- (2) have worked a total of at least 1000 hours in the Construction field during the prior 3 years; and
- (3) were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award.

No more than twelve per centum (12%) of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above. Under this provision, name referrals begin with the eighth employee needed and continue on that same basis.

C. Notwithstanding Section 2(B), above, certified MWBE contractors for which participation goals are set pursuant to New York City Administrative Code §6-129, that are not signatory to any Schedule A CBAs, with contracts valued at or under five hundred thousand (\$500,000), may request by name, and the Local will honor, referral of the second (2nd), fourth (4th), sixth (6th), and eighth (8th) employee, who have applied to the Local for Project Work and who meet the following qualifications:

- (1) possess any license required by New York State law for the Project Work to be performed;
- (2) have worked a total of at least 1000 hours in the Construction field during

the prior 3 years; and

- (3) were on the Contractor's active payroll for at least 60 out of the 180 work days prior to the contract award.

For such contracts valued at above \$500,000 but less than \$1 million, the Local will honor referrals by name of the second (2nd), fifth (5th), and eighth (8th) employee subject to the foregoing requirements. In both cases, name referrals will thereafter be in accordance with Section 2(B), above.

D. Where a certified MWBE Contractor voluntarily enters into a Collective Bargaining Agreement ("CBA") with a BCTC Union, the employees of such Contractor at the time the CBA is executed shall be allowed to join the Union for the applicable trade subject to satisfying the Union's basic standards of proficiency for admission.

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Council represents that each Local Union hiring hall and referral system will be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4. MINORITY AND FEMALE REFERRALS

In the event a Local Union either fails, or is unable to refer qualified minority or female applicants in percentages equaling the workforce participation goals adopted by the City and set forth in the Agency's (or, if applicable, Construction Manager's) bid specifications, within 48 hours of the request for same, the Contractor may employ qualified minority or female

applicants from any other available source.

SECTION 5. CROSS AND QUALIFIED REFERRALS

The Local Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

SECTION 6. UNION DUES

All employees covered by this Agreement shall be subject to the union security provisions contained in the applicable Schedule A local agreements, as amended from time to time, but only for the period of time during which they are performing on-site Project Work and only to the extent of tendering payment of the applicable union dues and assessments uniformly required for union membership in the Local Unions which represent the craft in which the employee is performing Project Work. No employee shall be discriminated against at any Project Work site because of the employee's union membership or lack thereof. In the case of unaffiliated employees, the dues payment will be received by the Local Unions as an agency shop fee.

SECTION 7. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule A, and provided that all craft forepersons shall be experienced and qualified journeypersons in their trade as determined by the appropriate Local Union. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft forepersons shall be designated as working forepersons at the

request of the Contractor, except when an existing local Collective Bargaining Agreement prohibits a foreperson from working when the craft persons he is leading exceed a specified number.

ARTICLE 5- UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site employees shall be entitled to designate in writing (copy to Contractor involved and Construction Manager) one representative, and/or the Business Manager, who shall be afforded access to the Project Work site.

SECTION 2. STEWARDS

A. Each Affiliated Union shall have sole discretion to select and designate any journey person as a Steward and an alternate Steward. The Union shall notify the Owner and/or Construction Manager as well as the Contractor, of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. All Stewards shall be working Stewards.

B. In addition to their work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's trade and, if applicable, subcontractors of their Contractor, but not with the employees of any other trade Contractor. No Contractor shall discriminate against the Steward in the proper performance of Union duties.

C. The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime except pursuant to a Schedule A provision providing

procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A provision, such provision shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6- MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to, the right to: direct the work force, including determination as to the number of employees to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; require compliance with the directives of the Agency including standard restrictions related to security and access to the site that are equally applicable to Agency employees, guests, or vendors; or the discipline or discharge for just cause of its employees; assign and schedule work; promulgate reasonable Project Work rules that are not inconsistent with this Agreement or rules common in the industry and are reasonably related to the nature of work; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual, as determined by the Contractor, Agency and/or Construction Manager and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitation or restriction upon the Contractors' choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials or products, tools, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source; provided, however, that where there is a Schedule "A" that includes a lawful union standards and practices clauses, then such clause as set forth in Schedule A Agreements will be complied with, unless there is a lawful Agency specification (or specification issued by a Construction Manager which would be lawful if issued by the Agency directly) that would specifically limit or restrict the Contractor's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials or products, tools, or other labor-saving devices, and which would prevent compliance with such Schedule A clause. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-off or testing of specialized or unusual equipment or facilities as designated by the Contractor. There shall be no restrictions as to work which is performed off-site for Project Work.

ARTICLE 7- WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Project Work site for

any reason by any Union or employee against any Contractor or employer. There shall be no other Union, or concerted or employee activity which disrupts or interferes with the operation of the Project Work or the objectives of the Agency at any Project Work site. In addition, failure of any Union or employee to cross any picket line established by any Union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other organization, at or in proximity to a Project Work site where the failure to cross disrupts or interferes with the operation of Project Work is a violation of this Article. Should any employees breach this provision, the Unions will use their best efforts to try to immediately end that breach and return all employees to work. There shall be no lockout at a Project Work site by any signatory Contractor, Agency or Construction Manager.

SECTION 2. DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the Local Union involved advising of such fact, with copies of the notification to the Council. The Local Union shall instruct and order, the Council shall request, and each shall otherwise use their best efforts to cause, the employees (and where necessary the Council shall use its best efforts to cause the Local Union), to immediately cease and desist from any violation of this Article. If the Council complies with these obligations it shall not be liable for the unauthorized acts of a Local Union or its members. Similarly, a Local Union and its members will not be liable for any unauthorized acts of the Council. Failure of a Contractor or the Construction Manager to give any notification set forth in this Article shall not excuse any violation of Section 1 of this Article.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A. A party invoking this procedure shall notify J.J. Pierson or Richard Adelman who shall alternate (beginning with Arbitrator J.J. Pierson) as Arbitrator under this expedited arbitration procedure. If the Arbitrator next on the list is not available to hear the matter within 24 hours of notice, the next Arbitrator on the list shall be called. Copies of such notification will be simultaneously sent to the alleged violator and Council.

B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the Local Union involved, the Council and the Construction Manager, hold a hearing within 48 hours of receipt of the notice invoking the procedure if it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice required by Section 3, above.

C. All notices pursuant to this Article may be provided by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the Arbitrator, Contractor, Construction Manager and Local Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case, and conduct their cross examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Execution Copy 3.11.13

Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages (any damages issue is reserved solely for court proceedings, if any.) The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

E. The Agency and Construction Manager (or such other designee of the Agency) may participate in full in all proceedings under this Article.

F. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved, and the Construction Manager.

G. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

H. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

SECTION 1. SUBJECTS

The Project Labor Management Committee will meet on a regular basis to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interests; 4) discuss matters relating to staffing and scheduling with safety and productivity as considerations; and 5) review efforts to meet applicable participation goals for MWBEs and workforce participation goals for minority and female employees.

SECTION 2. COMPOSITION

The Committee shall be jointly chaired by a designee of the Agency and the President of the Council. It may include representatives of the Local Unions and Contractors involved in the issues being discussed. The parties may mutually designate an MWBE representative to participate in appropriate Committee discussions. The Committee may conduct business through mutually agreed upon sub-committees.

ARTICLE 9- GRIEVANCE & ARBITRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation or application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below, provided, in all cases, that the question, dispute or claim arose during the term of this Agreement.

Step 1:

- (a) When any employee covered by this Agreement feels aggrieved by a

claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the work site representative of the involved Contractor and the Construction Manager. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence or event giving rise to the grievance. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved unless the settlement is accepted in writing by the Construction Manager (or designee) as creating a precedent.

(b) Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

The Business Manager or designee of the involved Local Union, together with representatives of the involved Contractor, Council and the Construction Manager (or designee), shall meet in Step 2 within 7 calendar days of service of the written grievance to arrive at a satisfactory settlement.

Step 3:

(a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 21 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants, including the Construction Manager or designee) to J.J. Pierson or Richard Adelman, who shall act, alternately (beginning with Arbitrator J.J. Pierson), as the Arbitrator under this procedure. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

(b) Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the Construction Manager (or designee), involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY

No arbitration decision or award may provide retroactivity of any kind exceeding 60 calendar days prior to the date of service of the written grievance on the Construction Manager and the involved Contractor or Local Union.

SECTION 3. PARTICIPATION BY AGENCY AND/OR CONSTRUCTION MANAGER

The Agency and Construction Manager (or such other designee of the Agency) shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election,

may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

All Project Work assignments shall be made by the Contractor to unions affiliated with the BCTC consistent with the New York Plan for the Settlement of Jurisdictional Disputes ("New York Plan") and its Greenbook decisions, if any. Where there are no applicable Greenbook decisions, assignments shall be made in accordance with the provisions of the New York Plan and local industry practice.

SECTION 3. NO INTERFERENCE WITH WORK

There shall be no interference or interruption of any kind with the Project Work while any jurisdictional dispute is being resolved. The work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be no strike, work stoppage or interruption in protest of any such award.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the hourly wage rates applicable for those classifications, as

required by the applicable prevailing wage laws.

SECTION 2. EMPLOYEE BENEFITS

A. The Contractors agree to pay on a timely basis contributions on behalf of all employees covered by this Agreement to those established jointly trustee employee benefit funds designated in the applicable Collective Bargaining Agreements in Schedule A (in the appropriate Schedule A amounts), provided that such benefits are required to be paid on public works under any applicable prevailing wage law. Bona fide jointly trustee fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly required under applicable prevailing wage law. Contractors, not otherwise contractually bound to do so, shall not be required to contribute to benefits, trusts or plans of any kind which are not required by the prevailing wage law provided, however, that this provision does not relieve Contractors signatory to local collective bargaining agreement with any affiliated union from complying with the fringe benefit requirements for all funds contained in the CBA.

B. The Contractors agree to be bound by the written terms of the legally established jointly trustee Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to Project Work done under this Agreement and only for those employees to whom this Agreement requires such benefit payments.

C. To the extent consistent with New York City's Procurement Policy Board Rules with respect to prompt payment, as published at www.nyc.gov/ppb, §4-06(e), and in consideration of the unions' waiver of their rights to withhold labor from a contractor or subcontractor delinquent in the payment of fringe benefits contributions ("Delinquent Contractor"); the Agency agrees that where any such union and/or fringe benefit fund shall

Execution Copy 3.11.13

notify the Agency, the General Contractor, and the Delinquent Contractor in writing with back-up documentation that the Delinquent Contractor has failed to make fringe benefit contributions to it as provided herein and the Delinquent Contractor shall fail, within ten (10) calendar days after receipt of such notice, to furnish either proof of such payment or notice that the amount claimed by the union and/or fringe benefit fund is in dispute, the Agency shall withhold from amounts then or thereafter becoming due and payable to the General Contractor an amount equal to that portion of such payment due to the General Contractor that relates solely to the work performed by the Delinquent Contractor which the union or fringe benefit fund claims to be due it, and shall remit the amount when and so withheld to the fringe benefit fund and deduct such payment from the amounts then otherwise due and payable to the General Contractor, which payment shall, as between the General Contractor and the Agency, be deemed a payment by the Agency to the General Contractor; provided however, that in any month, such withholding shall not exceed the amount contained in the General Contractor's monthly invoice for work performed by the Delinquent Contractor. The union or its employee benefit funds shall include in its notification of delinquent payment of fringe benefits only such amount it asserts the Delinquent Contractor failed to pay on the specific project against which the claim is made and the union or its employee benefit funds may not include in such notification any amount such Delinquent Contractor may have failed to pay on any other City or non-City project.

D. In the event the General Contractor or Delinquent Contractor shall notify the Agency as above provided that the claim of the union or fringe benefit fund is in dispute, the Agency shall withhold from amounts then or thereafter becoming due and payable to the General Contractor an amount equal to that portion of such payment due to the General Contractor that relates solely to the work performed by the Delinquent Contractor which the union and/or fringe benefit fund claims to be due it, and deposit such amount when and so withheld in a separate

interest-bearing account pending resolution of the dispute pursuant to the union's Schedule A agreement, and the amount so deposited together with the interest thereon shall be paid to the party or parties ultimately determined to be entitled thereto, or held until the Delinquent Contractor and union or fringe benefit fund shall otherwise agree as to the disposition thereof; provided however, that such withholding shall not exceed the amount contained in the General Contractor's monthly invoice for work performed by the Delinquent Contractor. In the event the Agency shall be required to withhold amounts from a General Contractor for the benefit of more than one fringe benefit fund, the amounts so withheld in the manner and amount prescribed above shall be applied to or for such fund in the order in which the written notices of nonpayment have been received by the Agency, and if more than one such notice was received on the same day, proportionately based upon the amount of the union and/or fringe benefit fund claims received on such day. Nothing herein contained shall prevent the Agency from commencing an interpleader action to determine entitlement to a disputed payment in accordance with section one thousand six of the civil practice law and rules or any successor provision thereto.

E. Payment to a fringe benefit fund under this provision shall not relieve the General Contractor or Delinquent Contractor from responsibility for the work covered by the payment. Except as otherwise provided, nothing contained herein shall create any obligation on the part of the Agency to pay any union or fringe benefit fund, nor shall anything provided herein serve to create any relationship in contract or otherwise, implied or expressed, between the union/fund and/or fringe benefit and the Agency.

**ARTICLE 12- HOURS OF WORK, PREMIUM PAYMENTS,
SHIFTS AND HOLIDAYS**

SECTION 1. WORK WEEK AND WORK DAY

A. The standard work week shall consist of 40 hours of work at straight time rates, Monday through Friday, 8 hours per day, plus ½ hour unpaid lunch period.

B. In accordance with Project needs, there shall be flexible start times with advance notice from Contractor to the Union. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 5:30 p.m. The Evening Shift shall commence between the hours of 3:00 p.m. and 6:00 p.m., unless different times are necessitated by the Agency's phasing plans on specific projects. The Night Shift shall commence between the hours of 11:00 p.m. and 2:00 a.m., unless different times are necessitated by the Agency's phasing plans on specific projects. Subject to the foregoing, starting and quitting times shall occur at the Project Work site designated by the Contractor.

C. Scheduling - Monday through Friday is the standard work week; 8 hours of work plus ½ hour unpaid lunch.

D. Notice - Contractors shall provide not less than 5 days prior notice to the Local Union involved as to the work week and work hour schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime shall be paid for any work over eight (8) hours in a day and over forty (40) hours in a week, at time and one half (1½) Monday through Saturday. All overtime work performed on Sunday and Holidays will be paid pursuant to the applicable Schedule A. There shall be no stacking or pyramiding of overtime pay under any circumstances. There will be no restriction upon the Contractor's scheduling of overtime or the nondiscriminatory designation of

employees who shall be worked, including the use of employees, other than those who have worked the regular or scheduled work week, at straight time rates. The Contractor shall have the right to schedule work so as to minimize overtime or schedule overtime as to some, but not all, of the crafts and whether or not of a continuous nature.

SECTION 3. SHIFTS

A. Flexible Schedules - Scheduling of shift work, including Saturday and Sunday work, shall be within the discretion of the Contractor in order to meet Project Work schedules and existing Project Work conditions including the minimization of interference with the mission of the Agency. It is not necessary to work a day shift in order to schedule a second or third shift, or a second shift in order to schedule a third shift, or to schedule all of the crafts when only certain crafts or employees are needed. Shifts must have prior approval of the Agency or Construction Manager, and must be scheduled with not less than five work days notice to the Local Union or such lesser notice as may be mutually agreed upon.

B. Second and/or Third Shifts/Saturday and/or Sunday Work - - The second shift shall start between 3 p.m. and 6 p.m. and the third shift shall start between 11 p.m. and 2 a.m., subject to different times necessitated by the Agency phasing plans on specific projects. There shall be no reduction in shift hour work. Shifts shall be paid in accordance with the Schedule A Collective Bargaining Agreements.

C. Flexible Starting Times - Shift starting times will be adjusted by the Contractor as necessary to fulfill Project Work requirements subject to the notice requirements of paragraph A.

SECTION 4. HOLIDAYS

A. Schedule - There shall be 8 recognized holidays on the Project:

New Years Day	Labor Day
Martin Luther King Day	President's Day
Memorial Day	Thanksgiving Day
Independence Day	Christmas Day

All said holidays shall be observed on the calendar date except those holidays which occur on Saturday shall be observed on the previous Friday and those that occur on Sunday shall be observed on the following Monday.

B. Payment - Regular holiday pay, if any, for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity - No holidays other than those listed in Section 4(A) above shall be recognized or observed.

SECTION 5. SATURDAY WORK

The Contractor may schedule a Saturday work day and such time shall be scheduled and paid at time and one-half (1½) unless the applicable Schedule A permits a straight time rate.

SECTION 6. REPORTING PAY

A. Employees who report to the work location pursuant to their regular schedule and who are not provided with work shall be paid two hours reporting pay at straight time rates. An employee whose work is terminated early by a Contractor due to severe weather, power failure, fire or natural disaster or for similar circumstances beyond the Contractor's control, shall receive pay only for such time as is actually worked. In other instances in which an

employee's work is terminated early (unless provided otherwise elsewhere in this Agreement), the employee shall be paid for his full shift.

B. When an employee, who has completed their scheduled shift and left the Project Work site, is "called out" to perform special work of a casual, incidental or irregular nature, the employee shall receive overtime pay at the rate of time and one-half of the employee's straight time rate for hours actually worked.

C. When an employee leaves the job or work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.

D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty, high time or other special premium payments or reduction in shift hours of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Article and except where an applicable Schedule A requires a full weeks' pay for forepersons.

SECTION 7. PAYMENT OF WAGES

A. Termination- Employees who are laid off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractor shall also provide the employee with a written statement setting forth the date of lay off or discharge.

SECTION 8. EMERGENCY WORK SUSPENSION

A Contractor may, if considered necessary for the protection of life and/or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees will be paid for actual time worked, except that when a Contractor requests that employees

remain at the job site available for work, employees will be paid for that time at their hourly rate of pay.

SECTION 9. INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than 8 hours wages for that day. Further, the employee shall be rehired at such time as able to return to duties provided there is still Project Work available for which the employee is qualified and able to perform.

SECTION 10. TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out. Each employee must check in and out. The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 11. MEAL PERIOD

A Contractor shall schedule an unpaid period of not more than 1/2 hour duration at the work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts or which provides for staggered lunch periods within a craft or trade. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 12. BREAK PERIODS

There will be no rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the employee's work location.

ARTICLE 13 - APPRENTICES

SECTION 1. RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications in the maximum ratio permitted by the New York State Department of Labor or the maximum allowed per trade. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate Schedule A. The parties encourage, as an appropriate source of apprentice recruitment consistent with the rules and operations of the affiliated unions' apprentice-programs, the use of the Edward J. Malloy Initiative for Construction Skills, Non-Traditional Employment for Women and Helmets to Hardhats.

ARTICLE 14-SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA and safety requirements are at all times maintained on the Project Work site and the employees and Unions agree to cooperate fully with these efforts to the extent consistent with their rights and obligations under the law. Employees will cooperate with employer safety policies and will perform their work at all times in a safe manner and protect themselves and the property of the Contractor and Agency from injury or harm, to the extent consistent with their rights and obligations under the law. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractors and the Construction Manager for this Project Work. Such rules will be published and posted in conspicuous places throughout the Project Work sites. Any site security and access policies established by the Construction Manager or General Contractor intended for specific application to the construction workforce for Project Work and that are not established pursuant to an Agency directive shall be implemented only after notice to the BCTC and its affiliates and an opportunity for negotiation and resolution by the Labor Management Committee.

SECTION 3. INSPECTIONS

The Contractors and Construction Manager retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE 15 - TEMPORARY SERVICES

Temporary services, i.e. all temporary heat, climate control, water, power and light, shall only be required upon the specific request of the Agency or Construction Manager, and when so requested shall be assigned to the appropriate trade claiming jurisdiction. Temporary system coverage shall be provided by the appropriate Contractors' existing employees during working hours in which a shift is scheduled for employees of this Contractor. The Agency or Construction Manager may determine the need for temporary system coverage requirements during non-working hours, which may be limited to one person per applicable trade where practicable. There shall be no stacking of trades on temporary services. In the event a temporary system is claimed by multiple trades, the matter shall be resolved through the New York Plan for Jurisdictional Disputes.

ARTICLE 16 - NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractors and Unions agree that they will not discriminate against any employee or applicant for employment because of creed, race, color, religion, sex, sexual orientation, national origin, marital status, citizenship status, disability, age or any other status provided by law, in any manner prohibited by law or regulation.

SECTION 2. LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 17- GENERAL TERMS

SECTION 1. PROJECT RULES

A. The Construction Manager and the Contractors shall establish such reasonable Project Work rules that are not inconsistent with this Agreement or rules common in the industry and are reasonably related to the nature of work. These rules will be explained at the pre-job conference and posted at the Project Work sites and may be amended thereafter as necessary. Notice of amendments will be provided to the appropriate Local Union. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

B. The parties adopt and incorporate the BCTC's Standards of Excellence as annexed hereto as Exhibit "B."

SECTION 2. TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement.

SECTION 5. FULL WORK DAY

Employees shall be at their work area at the starting time established by the Contractor, provided they are provided access to the work area. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION AND WAIVER

The Construction Manager, Contractors and the Unions will cooperate in seeking any NYS Department of Labor, or any other government, approvals that may be needed for implementation of any terms of this Agreement. In addition, the Council, on their own behalf and on behalf of its participating affiliated Local Unions and their individual members, intend the provisions of this Agreement to control to the greatest extent permitted by law, notwithstanding contrary provisions of any applicable prevailing wage, or other, law and intend this Agreement to

constitute a waiver of any such prevailing wage, or other, law to the greatest extent permissible only for work within the scope of this Agreement, including specifically, but not limited to those provisions relating to shift, night, and similar differentials and premiums. This Agreement does not, however, constitute a waiver or modification of the prevailing wage schedules applicable to work not covered by this Agreement.

ARTICLE 18. SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, or if such application may cause the loss of Project funding or any New York State Labor Law exemption for all or any part of the Project Work, the provision or provisions involved (and/or its application to particular Project Work, as necessary) shall be rendered, temporarily or permanently, null and void, but where practicable the remainder of the Agreement shall remain in full force and effect to the extent allowed by law (and to the extent no funding or exemption is lost), unless the part or parts so found to be in violation of law or to cause such loss are wholly inseparable from the remaining portions of the Agreement and/or are material to the purposes of the Agreement. In the event a court of competent jurisdiction finds any portion of the Agreement to trigger the foregoing, the parties will immediately enter into negotiations concerning the substance affected by such decision for the purpose of achieving conformity with the court determination and the intent of the parties hereto for contracts to be let in the future.

SECTION 2. THE BID SPECIFICATIONS

In the event that the Agency's (or Construction Manager's) bid specifications, or other action, requiring that a successful bidder (and subcontractor) become signatory to this

Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, or may cause the loss of Project funding or any New York State Labor Law exemption for all or any part of the Project Work, such requirement (and/or its application to particular Project Work, as necessary) shall be rendered, temporarily or permanently, null and void, but where practicable the Agreement shall remain in full force and effect to the extent allowed by law and to the extent no funding or exemption is lost). In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction only where the Agency and Contractor voluntarily accepts the Agreement. The parties will enter into negotiations as to modifications to the Agreement to reflect the court or other action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither the Agency, the Construction Manager, any Contractor, nor any Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order or injunction, other determination, or in order to maintain funding or a New York State Labor Law exemption for Project Work. Bid specifications will be issued in conformance with court orders then in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

A. Schedule A to this Agreement shall continue in full force and effect until

the Contractor and/or Union parties to the Area Collective Bargaining Agreements which are the basis for Schedule A notify the Agency and Construction Manager in writing of the hourly rate changes agreed to in that Area Collective Bargaining which are applicable to work covered by this Agreement and their effective dates.

B. It is agreed that any provisions negotiated into Schedule A collective bargaining agreements will not apply to work under this Agreement if such provisions are less favorable to those uniformly required of contractors for construction work normally covered by those agreements; nor shall any provision be recognized or applied on Project Work if it may be construed to apply exclusively, or predominantly, to work covered by this Agreement.

C. Any disagreement between signatories to this Agreement over the incorporation into Schedule A of provisions agreed upon in the renegotiation of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project Work by any Local Union involved in the renegotiation of Area Local Collective Bargaining Agreements nor shall there be any lock-out on such Project Work affecting a Local Union during the course of such renegotiations.

ARTICLE 20 - WORKERS' COMPENSATION ADR

SECTION 1.

An ADR Program may be negotiated and participation in the ADR Program will be optional by trade.

ARTICLE 21 - HELMETS TO HARDHATS

Section 1.

The Contractors and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and the Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.

Section 2.

The Unions and Contractors agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on this Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective
as of the ____ day of _____, _____

FOR BUILDING AND CONSTRUCTION TRADES COUNCIL
OF GREATER NEW YORK AND VICINITY

BY: _____
Gary LaBarbera, President

FOR NEW YORK CITY

BY: _____
(Name/Title)

APPROVED AS TO FORM:

ACTING CORPORATION COUNSEL
NEW YORK CITY

FOR THE LOCAL UNIONS

Boiler Makers Local No. 5

By: _____

Date: _____

Bricklayers Local No. 1

By: _____

Date: _____

Concrete Workers District Council No. 16

By: _____

Date: _____

Drywall Tapers 1974 DC 9

By: _____

Date: _____

Elevator Constructors No. 1

By: _____

Date: _____

Glaziers Local Union No. 1281 DC 9

By: _____

Date: _____

Heat & Frost Insulators Local Union No. 12A

By: _____

Date: _____

Carpenters District Council

By: _____

Date: _____

Cement Masons No. 780

By: _____

Date: _____

Derrickmen and Riggers Local Union No. 197

By: _____

Date: _____

Electrical Local No. 3

By: _____

Date: _____

Heat & Frost Insulators
Local Union No. 12

By: _____

Date: _____

Laborers Local 1010

Pavers and Road Builders District Council

By: _____

Date: _____

Plumbers No. 1

By: _____

Date: _____

Iron Workers Local No. 40

By: _____

Date: _____

Local 79 Construction and General Building
Laborers

By: _____

Date: _____

Metal Lathers Local No. 46

By: _____

Date: _____

Metal Polishers District Council #9

By: _____

Date: _____

Painters District Council # 9

By: _____

Date: _____

Painters, Decorators & Wallcoverers DC 9

By: _____

Date: _____

Painters Structural Steel No. 806

By: _____

Date: _____

Iron Workers District Council

By: _____

Date: _____

Iron Workers Local No. 361

By: _____

Date: _____

Laborers Local No. 29 Blasters and Drillers

By: _____

Date: _____

Laborers Local No. 78 Asbestos & Lead
Abatement

By: _____

Date: _____

Laborers Local No. 731 Excavators

By: _____

Date: _____

Mason Tenders District Council

By: _____

Date: _____

Ornamental Iron Workers No. 580

By: _____

Date: _____

Queens Hospital EMS Station

Roofers & Waterproofers
No. 8

By: _____

Date: _____

Sheet Metal Workers Local No. 28

By: _____

Date: _____

Plasterers Local Union No. 262

By: _____

Date: _____

Teamsters Local Union 814

By: _____

Date: _____

Teamsters Local Union No. 282

By: _____

Date: _____

Steamfitters Local Union
No. 638

By: _____

Date: _____

Sheet Metal Workers Local
No. 137

By: _____

Date: _____

Teamsters Local No. 813 Private Sanitation

By: _____

Date: _____

Tile, Marble & Terrazzo B.A.C. Local
Union No. 7

By: _____

Date: _____

SCHEDULE "A" LIST

Union	Time Period	Agreement w/
Architectural and Ornamental Iron Workers Local Union 580, AFL-CIO	July 1, 2008 - June 30, 2011; MOA July 1, 2008-June 30, 2013	Allied Building Metal Industries, Inc.
Blasters, Drill Runners and Miners Union, Local 29	July 1, 2006-June 30, 2012	GCA
Building, Concrete, Excavating & Common Laborers Local 731	July 1, 2006 - June 30, 2012	Independent
District Council No. 9, I.U.P.A.T Glaziers Local 1281	May 1, 2005 - April 30, 2011, MOA May 2011 - April 30, 2017	Window and Plate Glass Dealers Association
Drywall Tapers and Pointers Local 1974, affiliated with International Union of Painters & Allied Trades and Drywall Taping Contractor's Association & Association of Wall-Ceiling & Carpentry Industries NY, Inc.	August 3, 2011-June 27, 2017	Independent
Enterprise Association Local 638	July 1, 2011 - June 30, 2014	Mechanical Contractors Association of NY, Inc.
Enterprise Association Local 638	July 1, 2011 - June 30, 2014	Independent
Highway Road and Street Laborers Local Union 1010 of the District Council of Pavers and Road Builders of the Laborers' International Union of North America AFL-CIO	July 1, 2012 - June 30, 2015	Independent
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	July 1, 2008-June 30, 2014	Independent
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	July 1, 2008- June 30, 2014	The Insulation Contractors Association of New York City, Inc.
International Association of Heat and Frost Insulators and Allied Workers Local No. 12A of New York City	December 1, 2007 - November 30, 2012	Independent
International Association of Heat and Frost Insulators and Allied Workers Local No. 12A of New York City	December 1, 2007 - November 30, 2012	Environmental Contractors Association, Inc.

Queens Hospital EMS Station

International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, AFL-CIO, Local Lodge No. 5	January 1, 2010 - December 21, 2012	Boilermakers Association of Greater New York
Local Union No. 3 International Brotherhood of Electrical Workers, AFL-CIO	May 12, 2010 - May 8, 2013	New York Electrical Contractors Association
International Brotherhood of Teamsters, Local 282, High Rise contract	July 1, 2008 - June 30, 2013	Building Contractors Association & Independents
Local 46 Metallic Lathers Union and Reinforcing Iron Workers of NY and Vicinity of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers	July 1, 2008 - June 30, 2014; as amended by MOU July 1, 2012 - June 30, 2016	Cement League
Local 46 Metallic Lathers Union and Reinforcing Iron Workers of NY and Vicinity of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers	July 1, 2008 - June 30, 2014	Independent
Local 8 Roofers, Waterproofers & Allied Workers	July 1, 2009 - June 30, 2011	Roofing and Waterproofing Contractors Association of New York and Vicinity
Local Union 1 of the United Association of Journeymen and Apprentices of the Pipe Fitting Industry of the United States and Canada	July 1, 2010 - June 30, 2012; as amended by update 7.1.12-6.30.16	Association of Contracting Plumbers of the City of New York
Local Union Number 40 & 361 of Bridge, Structural Ornamental and Reinforcing Iron Workers AFL-CIO	July 1, 2008 - June 30, 2014	Independent
Mason Tenders DC & Laborers' International Union - Local 78 & 79	July 1, 2011 - June 30, 2014	Independent
Millwright Local 740	July 1, 2006 - June 30, 2011	Independent and with The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America
Operative Plasterers' and Cement Masons' International Association Local No. 262	February 1, 2010 - January 31, 2013; as amended by MOA 2012-2014	Independent

Queens Hospital EMS Station

Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	May 1, 2005 – April 30, 2011	Independent
Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	May 1, 2011 - April 30, 2015	The Association of Master Painters & Decorators of NY, Inc. and The Association of Wall, Ceiling & Carpentry Industries of NY, Inc. and The Window and Plate Glass Dealers Association
Sheet Metal Workers' International Association, Local 28	August 1, 2009 – July 31, 2011; MOA through July 31, 2014	Sheet Metal & Air Conditioning Contractors Association of New York City, Inc.
Sheet Metal Workers' International Association, Local 137	July 16, 2010- July 15, 2013	The Greater New York Sign Association
Structural Steel and Bridge Painters Local 806, DC 9 International Union of Painters and Allied Trades, AFL-CIO	October 1, 2005 - September 30, 2011	New York Structural Steel Painting Contractors Association
Teamsters Local 813	July 1, 2011 – June 30, 2014	Independent
Teamsters Local 813	December 1, 2008- November 30, 2011; as amended by MOA December 1, 2011- November 30, 2014	IESI NY Corporation
Teamsters Local 814	May 1, 2010 – April 30, 2013	Greater New York Movers and Warehousemen's Bargaining Group
The Cement Masons' Union, Local 780	October 23, 1940 - June 30, 2011; as amended by MOU July 1, 2012-June 30, 2013	Cement League
The DC of Carpenters of NYC and Vicinity, AFL-CIO for Dockbuilders Local 1456	May 1, 2007 - April 30, 2012	Independent

Queens Hospital EMS Station

The District Council of Cement and Concrete Workers (comprised of Local 6A; Local 18A and Local 20)	July 1, 2011 - June 30, 2014	Cement League
The District Council of Cement and Concrete Workers (comprised of Local 6A; Local 18A and Local 20)	July 1, 2011 - June 30, 2014	Independent
The District Council of New York City and Vicinity	July 1, 2006 - June 30, 2011	GCA
The District Council of New York City and Vicinity for Dockbuilders Local No. 1456	July 1, 2006 - June 30, 2011	GCA
The District Council of New York City and Vicinity for Timbermen Local 1536	July 1, 2006 - June 30, 2011	GCA
The District Council of New York City and Vicinity of the Brotherhood of Carpenters and Joiners of America, AFL-CIO	Shop Agreement July 1, 2007 - June 30, 2012	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	October 17, 2007 - October 16, 2012	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	Shop Agreement July 1, 2007 - June 30, 2012	Manufacturing Woodworkers Association of Greater New York Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	July 1, 2006 - June 30, 2011	The Hoisting Trade Association of New York, Inc.
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	October 17, 2007 - October 16, 2012	The Test Boring Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	July 1, 2006 - June 30, 2011	Building Contractors Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America, AFL-CIO	July 1, 2006 - June 30, 2011	The Association of Wall-Ceiling & Carpentry Industries of New York, Incorporated

Queens Hospital EMS Station

The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners, AFL-CIO	July 1, 2006 - June 30, 2011	The Cement League
The District Council of NYC and Vicinity of the United Brotherhood of Carpenters and Joiners of America and Millwright Local 740	July 1, 2006 - June 30, 2011	NYC Millwright Contractors Association
The Tile Setters and Tile Finishers Union of New York and New Jersey, Local 7 of the International Bricklayers and Allied Craftworkers	June 8, 2009 - June 2, 2013	The Greater New York and New Jersey Contractors Association
United Derrickmen & Riggers Association, Local 197 of NY, LI, Westchester & Vicinity	July 1, 2008 - June 30, 2013	Contracting Stonesetters Association Inc.
United Derrickmen & Riggers Association L 197 of NY, LI, Westchester and Vicinity	July 1, 2008 - June 30, 2013	Building Stone and Pre-cast Contractors Association

Project Labor Agreement - - Letter of Assent

The undersigned party confirms that it agrees to be a party to and be bound by the Project Labor Agreement Covering construction of an Emergency Medical Station to be built on vacant land on the Queens Hospital Campus, known as the Queens Hospital EMS Station, as such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Project Labor Agreement, its Schedules, Addenda and Exhibits are hereby incorporated by reference herein.

The undersigned, as a Contractor or Subcontractor (hereinafter Contractor) on the Project known as: Queens Hospital EMS Station and located at Queens Hospital, 159-10 Goethals Avenue, Jamaica, New York 11432 (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECT, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

- (1) Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all schedules; amendments and supplements now existing or which are later made thereto.
- (2) Agrees to be bound by the legally established collective bargaining agreements and local trust agreements as set forth in the Project Labor Agreement and this Agreement but only to the extent of Project Work and as required by the PLA.
- (3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor but only to the extent of Project Work as required by the PLA.
- (4) Certifies that it has no commitments or agreements that would preclude its full and complete compliance with the terms and conditions of said Agreement. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it has engaged or may engage to work on the Project. Labor harmony disputes/issues shall be subject to the Labor Management Committee provisions.
- (5) Agrees to secure from any Contractor(s) (as defined in said Agreement) which is or becomes a Subcontractor (of any tier), to it, a duly executed Agreement to be Bound in from identical to this document.

Provide description of work; identify craft jurisdiction(s) and all contract numbers below:

Name of Contractor or subcontractor: _____

Authorized Officer & Title: _____

Address: _____

Phone: _____ Fax: _____

Contractors State License #: _____

Entity your company is contracted with and address: _____

Dated: _____

Sworn to before me this
____ day of _____,
201__

Notary Public

NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL

STANDARDS OF EXCELLENCE

The purpose of this Standard of Excellence is to reinforce the pride of every construction worker and the commitment to be the most skilled, most productive and safest workforce available to construction employers and users in the City of New York. It is the commitment of every affiliated local union to use our training and skills to produce the highest quality work and to exercise safe and productive work practices.

The rank and file members represented by the affiliated local unions acknowledge and adopt the following standards:

- ***Provide a full days work for a full days pay;***
- ***Safely work towards the timely completion of the job;***
- ***Arrive to work on time and work until the contractual quitting time;***
- ***Adhere to contractual lunch and break times;***
- ***Promote a drug and alcohol free work site;***
- ***Work in accordance with all applicable safety rules and procedures;***
- ***Allow union representatives to handle job site disputes and grievances without resort to slowdowns, or unlawful job disruptions;***
- ***Respect management directives that are safe, reasonable and legitimate;***
- ***Respect the rights of co-workers;***
- ***Respect the property rights of the owner, management and contractors.***

The Unions affiliated with the New York City Building and Construction Trades Council will expect the signatory contractors to safely and efficiently manage their jobs and the unions see this as a corresponding obligation of the contractors under this Standard of Excellence. The affiliated unions will expect the following from its signatory contractors:

- ***Management adherence to the collective bargaining agreements;***
- ***Communication and cooperation with the trade foremen and stewards;***
- ***Efficient, safe and sanitary management of the job site;***
- ***Efficient job scheduling to mitigate and minimize unproductive time;***
- ***Efficient and adequate staffing by properly trained employees by trade;***
- ***Efficient delivery schedules and availability of equipment and tools to ensure efficient job progress;***
- ***Ensure proper blueprints, specifications and layout instructions and material are available in a timely manner***
- ***Promote job site dispute resolution and leadership skills to mitigate such disputes;***
- ***Treatment of all employees in a respectful and dignified manner acknowledging their contributions to a successful project.***

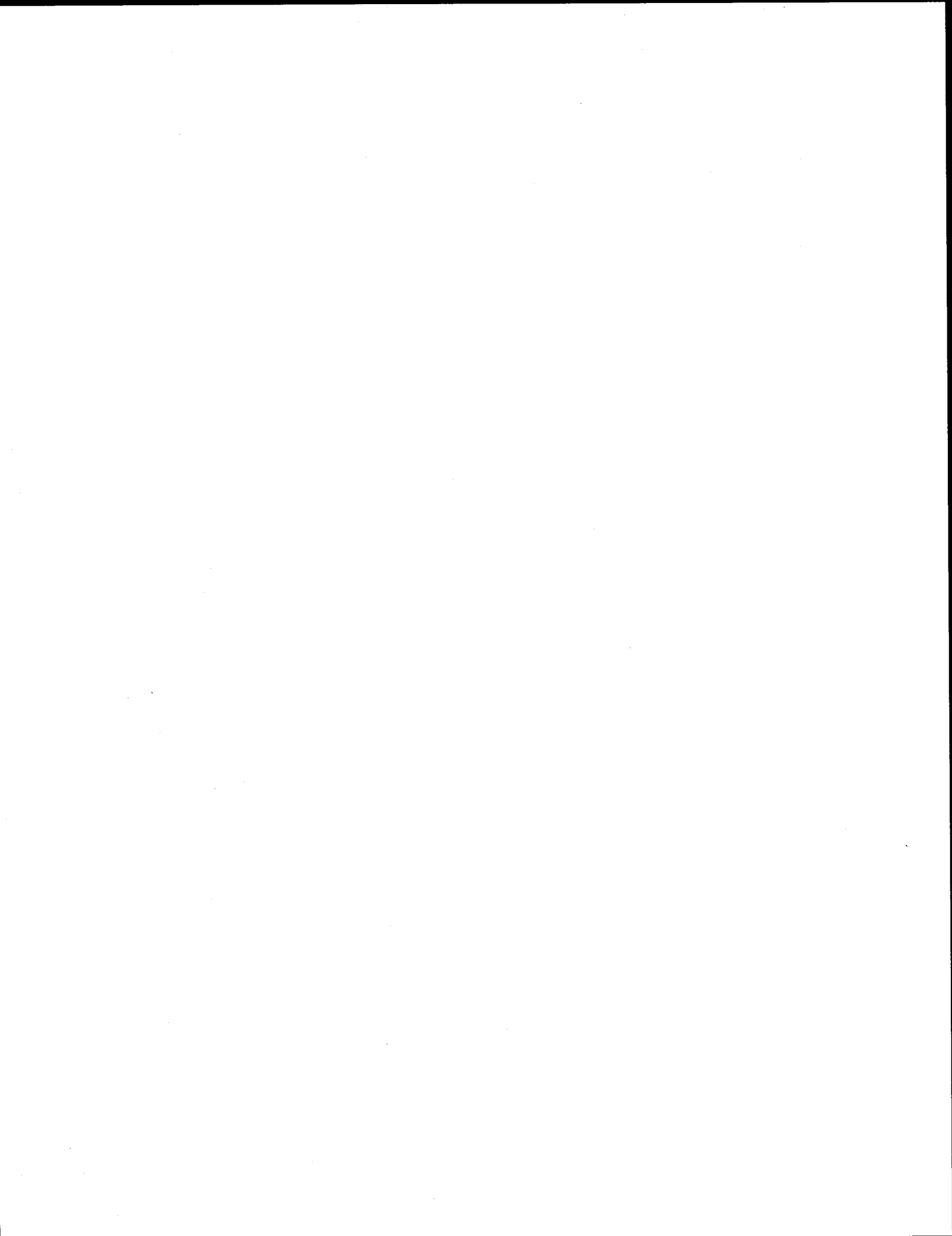
The affiliated unions and their signatory contractors shall ensure that both the rank and file members and the management staff shall be properly trained in the obligations undertaken in the Standards of Excellence.

ADDENDA CONTROL SHEET

TITLE: NEW QUEENS EMS STATION 50

**GENERAL
COUNSEL**

[illegible]



THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

July 9, 2013

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

F175QUEEN
NEW QUEENS EMS STATION 50

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. Questions from Bidders and Responses to Questions:

See Attachment A.

2. Revisions to Bid Booklet:

See Attachment B.

3. Revisions to Specifications:

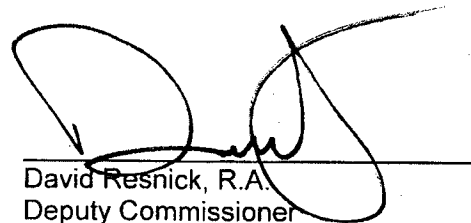
See Attachment C.

2. Revisions to Drawings:

See Attachment D.

THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-2200, (718) 391-1727, or by fax at (718) 391-2615.



David Resnick, R.A.
Deputy Commissioner

Name of Bidder

By: _____

DDC PROJECT #: F175 QUEEN

PROJECT NAME: NEW QUEENS EMS STATION 50

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	Drawing C-1. What is the elevation of the bottom of the tunnel structure where the 12" ST. piping passes beneath it?	See reference drawing Utility Tunnel Location & Elevation at the front of the drawing set. The floor of the tunnel is approx. +97'-8" and the 12" ST pipe is about 90' +/-.
2	Material ID Plan L-0, Reinforced concrete ramp. Detail 6 on L-4 indicates asphalt parking lot: 1 1/2" top course, 3" binder course, 8" crush stone. Please clarify.	See drawing S-2 & S-5 for concrete ramp. The ramp is a 14" framed concrete slab. Detail 6 on L-4 is for the parking Lot surface. The parking lot transitions from asphalt to concrete at the drive ramp.
3	Please provide contract information for BMS vendor for this project.	There is, at the present, no BMS vendor for this project.
4	On the contractor bid breakdown form there is a bid item "Lighting Protection System". There are no drawings or specs for lighting protection system.	There is no lighting protection system required for this project. See instructions Bid Booklet page 21, item C for preparing the Bid Breakdown Form.
5	On the contractor bid breakdown form there are some items which do not seem to apply as none were found on the drawings. We did not find any conduit, 1.25; receptacle, double duplex; and wire, #3. Please advise as to how we are to bid these items on the form? Does the contractor fill in N/A on any bid item which has not been found on the drawings.	See instructions on Bid Booklet page 21, item C for preparing the Bid Breakdown Form.
6	On the contractor bid breakdown form bid item 'Receptacle duplex' and receptacle, duplex, 20A are the same as the legend on dwg E-11 specifying only 20A duplex receptacles. Please clarify.	These are the same items, a 20A duplex receptacle.
7	a) EMS Station 50 Structural Concrete Plans don't have necessary elevation information. At the foundation concrete section sheet S17 (elevation sheet) there is no elevation shown. Details are shown without elevation. b) Pile elevation information seems to be missing from the drawings also. Drawings show top of the pile cap but no information on how deep the piles go into the ground.	a) See Architectural drawings A6.4-A6.9 for elevations of all concrete walls. b) See Specification section 316216 for pile lengths.

8	In speaking with two separate vendors identified in this contract, Dwyer and Geargrid, both have noted that their products (model numbers) for this project will differ from what is listed in the contract documents. Please advise.	Please see Attachment C, Revisions to Specifications for clarifications.
9	What is the material for the tunnel duct?	The material for the tunnel duct is 16 ga. 304 stainless steel duct, hangers and fasteners.
10	Please confirm that the amounts of \$148,690 for the Exhaust system and \$158,000 for the Overhead doors do not include the labor portion for these two items.	The allowances for the Nederman System and the Fimble Overhead Doors include a fully installed turn-key system.
11	Per Drawing A5.1 Sections 2 and 3 both details show membrane waterproofing, please confirm there is no membrane water proofing on the project and interior walls are to receive Crystalline Waterproofing in accordance with Specification 071616.	There is no membrane waterproofing on the project. See Attachment D, Revisions to Drawings.

DDC PROJECT #: F175 QUEEN

PROJECT NAME: NEW QUEENS EMS STATION 50

ATTACHMENT B – REVISIONS TO THE BID BOOKLET

Bid Booklet: The Bid Booklet is amended as set forth below.

- SCHEDULE B – M/WBE Utilization Plan: Delete page 6-R previously issued with Addendum 1 and replace with attached page 6-Ra, included with this addendum.
- Bid Form: Delete the page of Bid Form for insertion of the Total Bid Price, as well as signature by the bidder (page 13), and replace it with the new page for insertion of the Total Bid Price attached to this Addendum (page 13-R).

Tax ID #: _____

APT E-

PIN#: 85013B0106

Contract # 1 - General Construction Work

SCHEDULE B - M/WBE Utilization Plan**Part I: M/WBE Participation Goals**

Part I to be completed by contracting agency

Contract Overview

APT E-Pin #	<u>85013B0106</u>	FMS Project ID#:	<u>F175QUEEN</u>
Project Title/Agency	<u>NEW EMS STATION 50</u>		
PIN #	<u>8502013FI0003C</u>		
Bid/Proposal			
Response Date:	<u>July 17, 2013</u>		
Contracting Agency	<u>Department of Design and Construction</u>		
Agency Address	<u>30-30 Thomson Avenue</u>	City	<u>Long Island City</u> State <u>NY</u> Zip Code <u>11101</u>
Contact Person	<u>James A. Cerasoli</u>	Title	<u>Deputy Director</u>
Telephone #	<u>(718) 391-1549</u>	Email	<u>cerasoli@ddc.nyc.gov</u>

Project Description (attach additional pages if necessary)

This Project consists of the construction of a new EMS Station at the Queens Hospital Campus for the FDNY. The building is a two story steel frame with concrete foundations on piles

M/WBE Participation Goals for Services

Enter the percentage amount for each group or for an unspecified goal.

Prime Contract Industry: Construction

Group	Percentage	
<u>Unspecified</u>	<u>10</u>	<u>%</u>
or		
Black American		%
Hispanic American		%
Asian American		%
Women		%
Total Participation Goals	10	%

Line 1

BID FORM

PROJECT ID: F175QUEEN

TOTAL BID PRICE: In the space provided below, the Bidder shall indicate the total bid price in figures.

- A. LUMP SUM PRICE - Total price for all labor and material for all required work, excluding items (B) and (C) set forth below. Total Price shall include all costs and expenses, i.e. labor, material overhead and profit for all the Work, described and shown in the drawings and specifications.

Total Price For
Labor

Total Price for Material Sold and
Delivered

\$ _____ + \$ _____ Total Price for Item A= \$ _____

B. ALLOWANCE for Incidental Asbestos Abatement
(Section 028013 of the Specifications) \$15,000.00

C. AMOUNT for Proprietary Items (pages 2a) \$306,690.00

TOTAL BID PRICE (Add A + B + C) \$ _____
(a/k/a BID PROPOSAL)

BIDDER'S SIGNATURE AND AFFIDAVIT

- * **SUBCONTRACTOR IDENTIFICATION:** You MUST complete and submit the form entitled "Bidder's Identification of Subcontractors" (page 17) at the time you submit your bid. You must submit this form in a separate, sealed envelope (BID ENVELOPE #2). In the event an award of contract is not made to the Bidder, the Bidder hereby authorizes the Agency to shred the form entitled "Bidder's Identification of Subcontractors". Yes _____ No _____

- * **M/WBE UTILIZATION PLAN:** By signing its bid in the space below, the bidder agrees to the Vendor Certification and Required Affirmations set forth below, unless a full waiver of the Participation Goals is granted. The Vendor Certification and Required Affirmations will be deemed to satisfy the requirement to complete Section V of Part II of Schedule B: M/WBE Utilization Plan.

Section V: Vendor Certification and Required Affirmations: I hereby: 1) acknowledge my understanding of the M/WBE participation requirements as set forth in this Contract and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York and the rules promulgated thereunder; 2) affirm that the information supplied in support of the M/WBE Utilization Plan is true and correct; 3) agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract; 4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and 5) agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or If a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Bidder: _____

By: _____
(Signature of Partner or corporate officer)

Attest:
(Corporate Seal)

Secretary of Corporate Bidder

Affidavit on the following page should be subscribed and sworn to before a Notary Public

DDC PROJECT #: F175 QUEEN

PROJECT NAME: NEW QUEENS EMS STATION 50

ATTACHMENT C – REVISIONS TO THE SPECIFICATIONS

Specification Section 109000 Miscellaneous Specialties (issued in Addendum 1)

Article 2.2, article A is revised as follows:

Delete article A-1 and replace with the following:

1. **Geargrid Lockers** Model No. 492022 Qty. 15

DDC PROJECT #: F175 QUEEN

PROJECT NAME: NEW QUEENS EMS STATION 50

ATTACHMENT D – REVISIONS TO THE DRAWINGS

REFER TO DRAWING L-0

1. Clarification: Revise Tag 6/L3, for Parking lot detail, to 6/L4.

REFER TO DRAWING A-1.3

1. Delete Note: Overhead shelving, Cabinet and Built-in desk indicated in ALS Rm. 109.
2. Delete Note: Built-in Desk, Plastic Laminate w/HDWD edge.

REFER TO DRAWING A-5.1

1. Revise all references to 'Water Proof Membrane' to 'Crystalline Waterproofing'.

REFER TO DRAWING A-7.1

1. Clarification: Furniture Schedule- Level 1 Apparatus Floor Revise GearGrid Model No.# 492022 Mobile Geargrid Lockers Quantity 15. Delete Note: 42 Racks total.
2. Clarification: BLS Rm. 120 Provide Super Erecta Mobile Wire Shelving system by Metro: (10) 24" x 4'-0" #2448NS Stainless Steel Finish, 3 shelves per segment.

REFER TO DRAWING A-9.8

1. Delete Detail 4 and 6. All full height cabinets, upper cabinets and tackable surface to be deleted from scope.
2. Clarification Det. 8. Modify extent of counter top: Provide 2" th Plas. Lam. Counter top 3'-0"H x 13"D x 5'-0" L. See det. 9 for support legs.
3. In lieu of millwork provide Super Erecta Mobile Wire Shelving system by Metro: (1) 18" x 6'-0" #1872NS (1) 24" x 5'-0" #2460NS Stainless Steel Finish, 3 shelves per segment.

REFER TO DRAWING P-16

1. Clarification: PLUMBING FIXTURE SCHEDULE Revise item EW as follows:
EW/S (Eyewash/Shower) Haws 8300-8309 combination eyewash and shower, or approved equal.

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF STRUCTURES

ADDENDUM TO THE GENERAL CONDITIONS

The General Conditions are hereby amended in accordance
with the terms and conditions set forth in this Addendum.

I. PROJECT DESCRIPTION

FMS #: **F175QUEEN**

PROJECT NAME: **EMS Station 50 Queens Hospital**

PROJECT DESCRIPTION: **This Project consists of the construction of a new EMS Station at the Queens Hospital Campus for the FDNY. The building is a two story steel frame with concrete foundations on piles.**

PROJECT LOCATION: **159-10 Goethals Avenue**
BOROUGH: **Queens**
CITY OF NEW YORK
ZIP CODE: **11432**
COMMUNITY BOARD #: **12 (Jamaica)**

PROJECT MANAGEMENT:

- ☐ DDC shall publicly bid and enter into a single Contract for the Project. DDC shall manage the Project using its own personnel.
- ☒ DDC shall publicly bid and enter into a single Contract for the Project. A Construction Management firm (the "CM") hired by DDC shall manage the Project. The Contractor is advised that the CM shall serve as the representative of the Commissioner at the site and shall, subject to review by the Commissioner, be responsible for the inspection, management, coordination and administration of the required construction work, as delineated in the article of the Standard Construction Contract (September 2008) entitled "The Resident Engineer".
- ☐ DDC has entered into CM/Build Contract for the Project. The CM/Build Contractor shall be responsible for conducting a competitive bid process and entering into the contract(s) for the Project.

II. CM / BUILD CONTRACT: REVISIONS TO THE GENERAL CONDITIONS

NOT USED

III. CONTRACTS FOR THE PROJECT

The Project consists of a single contract, the Contract for General Construction Work. The Contractor for General Construction Work is responsible for the performance of all required work for the Project as set forth in the Contract Documents, including all responsibilities and obligations assigned to separate Contractors for the following subdivisions of the work: Plumbing Work, HVAC Work, and Electrical Work. All responsibilities and obligations in the Contract Documents assigned to separate Contractors for such subdivisions of the work are the responsibility of the Contractor for General Construction Work.

This contract is subject to a Project Labor Agreement ("PLA"). In accordance with the Labor Law, the requirements of the Wicks Law for separate prime contractors do not apply to any project that is covered by a PLA. Accordingly, the requirements of the Wicks Law for separate prime contractors do not apply to this Project. However, the Contract Documents for this Project (General Conditions, Drawings and Specifications) were prepared as if the requirements of the Wicks Law for separate prime contractors did apply. To correct this situation, the Contractor is advised that the Contract Documents are revised as set forth below:

(A) Delete any and all references to separate responsibilities, separate specifications, separate drawings and/or separate contracts for the following subdivisions of the work: Plumbing Work, HVAC Work, and Electrical Work.

(B) Revise all such references to indicate that: (1) the Project consists of a single contract, the Contract for General Construction Work, and (2) all responsibilities and obligations in the Contract Documents assigned to the separate Contractors for the four subdivisions of the work are the responsibility of the Contractor for General Construction Work.

IV. SCHEDULES

The Contractor is advised that Schedules A through F are attached to, and incorporated as part of, this Addendum to the General Conditions. These schedules contain important information that is specific to this Project. The Contractor is advised to carefully review these schedules.

V. APPLICABILITY OF ARTICLES AND AMENDED ARTICLES

The Contractor is advised that various Articles in the General Conditions may not apply to this Project or may apply as amended. Such Articles advise the Contractor to "Refer to the Addendum to the General Conditions for the applicability of this Article." Such Articles are set forth below. A check mark indicates whether the Article (1) applies to the Project, (2) does not apply to the Project, or (3) applies to the Project as amended. If no box is checked, the Article, as set forth in the General Conditions, applies to the Project. Amended Articles, if any, are set forth following this list of Articles.

<u>Article No.</u>	<u>Article</u>	<u>Sub-Article or PART</u> (if applicable)	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
1.04	Contract Drawings	C) PRINTS	x		
1.05	Shop Drawings and Record Drawings	B) INTEGRATED DRAWINGS	x		
1.09	Surveys		x		
1.13	Sleeves and Hangers		x		
1.15	Temporary Heat			x	
1.20	Progress Photographs	C)			x
1.26	Security Guards/Fire Guards on the Site		x		

<u>Article No.</u>	<u>Article</u>	<u>Sub-Article or PART</u> (if applicable)	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
1.29	Sleeve and Penetration Drawings		x		
1.30	Location of Partitions		x		
1.34	Temporary Services	PART A	x		
		PART B		x	
1.35	Temporary Use, Operation and Maintenance of Elevators during Construction	PART A – For New Buildings Up to 15 Stories	x		
		PART B – For New Buildings Over 15 Stories		x	
		PART C – Existing Buildings		x	

1.36	General Mechanical Requirements		x		
1.37	General Electrical Requirements	PART B – Section A) Temporary Lighting	x		
		PART B – Section B) Site Security Lighting (New Construction)	x		
		PART D – Electrical Conduit System Including Boxes	x		
		PART E – Electrical Wiring Devices	x		
		PART F – Electrical Conductors and Terminators	x		
		PART G – Circuit Protective Devices	x		
		PART H – Distribution Centers	x		
		PART I – Motors	x		
		PART J – Motor Control Equipment	x		
1.40	Separation Between Trades				
1.42	Specific Requirements	C) BORINGS	x		
		E) WORK FENCE ENCLOSURE	x		
		G) RESIDENT ENGINEER'S OFFICE			
		1. OFFICE SPACE IN EXISTING BUILDING		x	
		2. TRAILER OFFICE-60' TRAILER			x

		H)	ADDITIONAL EQUIPMENT FOR THE RESIDENT ENGINEER	x			
		I)	PUBLIC TELEPHONE	x			
		Q)	PROJECT SIGN AND RENDERING				
			PART B – PROJECT RENDERING	x			

COMPUTER WORKSTATIONS

H) Number of Computer Workstations to be provided as outlined in Article 1.42 H, item 4: 2

AMENDED ARTICLES

The Contractor is advised that the amended Articles set forth below are included in the General Conditions and apply to the Project.

1.20 Progress Photographs

C. ADDITIONAL PHOTOGRAPHS-There shall be at least 15 photos taken each week that document all areas where there has been significant progress achieved. These photos shall describe important details, and conditions that will be concealed during subsequent construction. These photos shall be digital files of .JPEG or .TIFF format with minimum resolution of 8 megapixels and shall be of good image quality with respect to focus and exposure. Photo files shall be downloaded by the Resident Engineer onto hard drive of on-site computer work station each week and transmitted via email to the Commissioner and the Consultant Architect each week.

1.42

G.2.c

- c. Trailer shall be office type trailer of the following general minimum dimensions:
1. Length, overall: 60 feet.
 2. Length, inside: 32 feet.
 3. Width, overall: 8 feet.
 4. Width, inside: 7 feet, 5 inches.

VI. ADDITIONAL ARTICLES

NOT USED

VII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

- (1) **GENERAL:** Special Experience Requirements applicable to the contractor or subcontractor that will perform specific areas of work are set forth below.
- (2) **REVISION OF SPECIFICATIONS AND DRAWINGS:** In the event the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth below, such Special Experience Requirement is deemed deleted, except as otherwise expressly provided in Section VI of this Addendum.
- (3) **SPECIAL EXPERIENCE REQUIREMENTS FOR SPECIFIC AREAS OF WORK:** The special experience requirements set forth below apply to the contractor or subcontractor that will perform specific areas of work. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of such award, the contractor will be required to submit the qualifications of the contractor or subcontractor that will perform these specific areas of work. If the contractor intends to perform these specific areas of work with its own forces, it must demonstrate compliance with the special experience requirements. If the contractor intends to subcontract these specific areas of work, the proposed subcontractor(s) must demonstrate compliance with the special experience requirements. Once approved, no substitution will be permitted, unless the qualifications of the proposed replacement have been approved in writing in advance by the City.
 - (a) **Special Experience Requirement #1:** The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. This Special Experience Requirement applies to the contractor or subcontractor that will perform specific areas of work specified in the section set forth below.

General Construction Work:

- Section 084413: Structural Sealant Glazed Curtain Walls

- (b) **Special Experience Requirement #2:** The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. In addition, the contractor or subcontractor must be licensed or approved by the manufacturer of the roofing system. This Special Experience Requirement applies to the contractor or subcontractor that will perform specific areas of work specified in the section set forth below.

General Construction Work:

- Section 075419: Polyvinyl-Chloride (PVC) Roofing

VIII. REVISIONS: SPECIFICATIONS AND CONTRACT DRAWINGS

The Specifications and the Contract Drawings for the Project are revised in accordance with the provisions set forth below.

- (1) Owner: Wherever the term "Owner" is used in the Specifications and/or the Contract Drawings, such term shall mean the City of New York.
- (2) Other Entities: In the event any entity other than the City of New York is referred to or named as the "Owner" in the Specifications and/or the Contract Drawings, the name of such other entity is deemed deleted and replaced with the "City of New York".
- (3) Architect / Engineer: Wherever the words "Architect", "Engineer", "Architect / Engineer" or "Architect and/or Engineer" are used in the Specifications and/or the Contract Drawings, such words are deemed deleted and replaced with the word "Commissioner".
- (4) Products / Manufacturers: Wherever the Specifications and/or the Contract Drawings require the contractor to provide a particular product (i.e., material and/or equipment) from a designated manufacturer and/or vendor, the term "or approved equal" is deemed inserted, even if only one product and/or manufacturer is specified, except as otherwise provided below.
 - (a) Proprietary Items: If the Bid Booklet contains a Notice which identifies a particular product from a designated manufacturer as a "Proprietary Item", the Contractor shall be required to provide such specified product. In such case, no substitution or "approved equal" will be permitted.
- (5) Special Experience Requirements: Special Experience Requirements for the Project, if any, are set forth in the Bid Booklet. Special Experience Requirements may apply to contractors, subcontractors, installers, manufacturers and/or suppliers. If the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth in the Bid Booklet, such Special Experience Requirement is deemed deleted, except as otherwise provided below.
 - (a) Any Special Experience Requirement that provides that the entity performing the work or supplying the material must have more than three (3) years of experience, is revised to provide that the entity performing the work or supplying the material must have three (3) years of experience, except as described in paragraph (b) below.
 - (b) Any Special Experience Requirement that pertains to the abatement of hazardous materials shall not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement shall remain in full force and effect.
 - (c) Any Special Experience Requirement that provides that the entity performing the work must be licensed, authorized, certified, approved by or acceptable to the manufacturer, is deemed deleted and replaced with the requirement that such entity must be properly trained for the specified work.
 - (d) Any Special Experience Requirement that provides that the individual workers performing the work must be licensed, authorized, certified, approved by or acceptable to the manufacturer, is deemed deleted and replaced with the requirement that such individual workers must be properly trained for the specified work.
- (6) Alternate Bids: If the agency is requesting the submission of Alternate Bids, a Notice regarding such Alternate Bids is set forth in the Bid Booklet. In the event of any conflict or inconsistency between (1) the Notice regarding Alternate Bids set forth in the Bid Booklet and (2) a provision in the Specifications and/or the Contract Drawings regarding Alternate Bids, the Notice set forth in the Bid Booklet shall prevail. If the agency is not requesting the submission of Alternate Bids, as indicated by the absence of a Notice in the Bid Booklet, and the Specifications and/or the Contract Drawings contain any provision regarding Alternate Bids, such provision is deemed deleted.
- (7) Contractor Retained Engineer: If the Specifications and/or the Contract Drawings require the Contractor to retain an Engineer to provide engineering services for the Project, the following sentence is deemed inserted: "Such Engineer must be a Professional Engineer, licensed in the State of New York."

- (8) LEED Related Provisions: If the Specifications and/or the Contract Drawings require the Contractor to purchase FSC certified wood, rapidly renewable materials, or materials within 500 miles, such provisions are deemed deleted and replaced with the requirement that if the contractor has purchased FSC certified wood, rapidly renewable materials, or materials within 500 miles, the contractor shall submit such forms or documentation as may be required by the City in order for the USGBC to certify that the Project qualifies for the related LEED credit(s).
- (9) Guarantees: Requirements for Guarantees and Maintenance are set forth in Schedule B, which is included in the Addendum to the General Conditions. In the event of any conflict or inconsistency between (1) a guarantee and/or maintenance requirement set forth in the Specifications and/or the Contract Drawings and (2) a guarantee and/or maintenance requirement set forth in Schedule B, the guarantee and/or maintenance requirement set forth in Schedule B shall prevail.
- (10) Warranties: Requirements for Warranties are set forth in Schedule B, which is included in the Addendum to the General Conditions.
- (a) In the event of any conflict or inconsistency between (1) a warranty requirement set forth in the Specifications and/or the Contract Drawings and (2) a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall prevail.
- (b) In the event a warranty requirement set forth in the Specifications and/or the Contract Drawings is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications and/or the Contract Drawings, shall remain in full force and effect.
- (c) In the event a warranty requirement for a particular item of material or equipment is omitted from Schedule B, as well as from the Specifications or the Contract Drawings, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.
- (11) Exculpatory Provisions: In the event the Specifications and/or the Contract Drawings contain any provision whereby the consultant and/or any of its officers, employees or agents, including subconsultants, is absolved of responsibility for any act or omission, such provision is deemed deleted.
- (12) Insurance: Provisions regarding insurance coverage the Contractor is required to provide are set forth in Article 22 of the City of New York Standard Construction Contract and Schedule A, which is included in the Addendum to the General Conditions. In the event the Specifications and/or the Contract Drawings contain any provision regarding insurance requirements, such provision is deemed deleted.
- (13) Indemnification: Provisions regarding indemnification are set forth in Articles 7, 12, 22 and 57 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding indemnification, such provision is deemed deleted.
- (14) Dispute Resolution: Provisions regarding dispute resolution are set forth in Article 27 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding dispute resolution, such provision is deemed deleted.
- (15) Payment to Other Entities: In the event the Specifications and/or the Contract Drawings contain any provision which requires the Contractor to make payments to an entity other than a subcontractor and/or supplier providing services and/or material for the project, such provision is deemed deleted.
- (16) General Conditions: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the General Conditions, the General Conditions shall prevail.
- (17) Standard Construction Contract: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the City of New York Standard Construction Contract, the City of New York Standard Construction Contract shall prevail.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)**Contract Requirements**

Various Articles of the Contract refer to requirements which are set forth in Schedule A of the General Conditions. The Schedule set forth below specifies the following: (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the contract.

REFERENCE	ITEM	REQUIREMENTS	CONTRACT FOR GENERAL CONSTRUCTION	
Article 14 Contract	Time of Completion	Consecutive Calendar Days	720 ccds	
Article 15 Contract	Liquidated Damages Completion	For each consecutive calendar day over time	\$600	
Article 17 Contract	Sub- contracts	Not to exceed percent of Contract Price	60%	
Article 21 Contract	Retainage	Percent of voucher	If 100% bonds are required	5%
			If 100% bonds are not required, and Contract Price is less than \$1,000,000	10%
			If 100% bonds are not required, and Contract Price is more than \$1,000,000	10%
Article 24 Contract	Maintenance & Guaranty	Percent of Contract Price	1%	
Article 77 Contract	MWBE Program	See Subcontractor Utilization Plan in the Bid Booklet		

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART I. Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
<div>■ Commercial General Liability Art. 22.1.1</div>	<div>\$ 1,000,000 per occurrence \$ 2,000,000 aggregate (applicable separately to this Project)</div> <div>Additional Insureds: 1. City of New York, including its officials and employees, and</div> <div>2. _____ 3. _____</div>
<div>■ Workers' Compensation Art. 22.1.2</div> <div>■ Disability Benefits Insurance Art. 22.1.2</div> <div>■ Employers' Liability Art. 22.1.3</div> <div><input type="checkbox"/> Jones Act Art. 22.1.4</div> <div><input type="checkbox"/> U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.4</div>	<div>Workers' Compensation: Statutory per New York State law without regard to jurisdiction</div> <div>Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction</div> <div>Employers' Liability: \$1,000,000 each accident</div>
<div>■ Builders' Risk Art 22.1.5</div> <div><input type="checkbox"/> Installation Floater</div>	<div>Applicable to Builders' Risk or Installation Floater: _____ 100 _____ % of total value of Work</div> <div>City of New York and the Contractor named as Loss Payee for the Work in order of precedence, as their interests may appear.</div> <div><u>Note:</u> Article 22.1.5 is revised by deleting the following sentence: "Such policy shall name as insureds the City, the Contractor, and its Subcontractors". This deletion applies to Builders' Risk and Installation Floater.</div>

SCHEDULE A FOR CM/BUILD PROJECTS

Relating to Insurance

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART I. Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Comprehensive Business Auto Coverage Art. 22.1.6	<p>\$ <u>1,000,000</u> per accident</p> <p>If vehicles are used for transporting hazardous materials, the Contractor shall provide pollution liability broadened coverage for covered autos (endorsement CA 99 48) as well as proof of MCS 90</p> <p>Additional Insured: 1. City of New York, including its officials and employees</p>
<input type="checkbox"/> Pollution/Environmental Liability Art. 22.1.7	<p>\$ _____ per occurrence</p> <p>\$ _____ aggregate</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____</p>
<input type="checkbox"/> Marine Protection and Indemnity Art. 22.1.8(a)	<p>\$ _____ per occurrence</p> <p>\$ _____ aggregate</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____</p>

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART I. Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

<input type="checkbox"/> Ship Repairers Legal Liability Art. 22.1.8(b)	\$_____ each occurrence [Contracting agency to fill in total value of City vessels involved]
<input type="checkbox"/> Collision Liability/Towers Liability Art. 22.1.8(c)	\$_____ per occurrence \$_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
<input type="checkbox"/> Marine Pollution Liability Art. 22.1.8(d)	\$_____ each occurrence Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.9 <input type="checkbox"/> Railroad Protective Liability _____	\$_____ per occurrence \$_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____

Relating to Article 22 - Insurance

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Addendum to the General Conditions
September 1, 2009

SCHEDULE B

Guarantees and Warranties

(Reference: Article 1.22 of the General Conditions)

GUARANTY FROM CONTRACTOR

(1) Contractor's Guaranty Obligation: The Contractor shall promptly repair, replace, restore or rebuild, as the Commissioner may determine, any finished Work in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of Substantial Completion (or use and occupancy in accordance with the Contract), except for the areas of Work set forth below:

- Roofing, Waterproofing, and Joint Sealant Work. For these types of work, the guarantee period shall be (2) two years.
- Trees and/or Plant Material. For trees and/or plant material furnished and installed, the guarantee period shall be (2) two years. During the guarantee period, the Contractor shall provide all maintenance services set forth in the Specifications.

(2) Guaranty Period: The obligation of the Contractor, and its Surety under the Performance Bond, is limited to the period(s) of time specified above.

(3) Other Provisions Deemed Deleted: In the event the Specifications and/or the Contract Drawings contain any provisions regarding guaranty requirements, such provisions are deemed deleted and replaced with the guaranty requirements set forth in this Schedule B.

WARRANTY FROM MANUFACTURER

(1) Contractor's Obligation to Provide Warranties: The items of material and/or equipment for which manufacturer warranties are required are listed below. For each item of material and/or equipment listed below, the Contractor shall obtain a written warranty from the manufacturer. Such warranty shall provide that the material or equipment is free from defects for the period set forth below and will be replaced or repaired within such specified period. The Contractor shall deliver all required warranties to the Commissioner.

(2) Required Warranties:

Specification Number	Material or Equipment	Warranty Period
071616	Crystalline Waterproofing	10 yrs
074243	Aluminum Composite Wall Panels	10 yrs
075419	Polyvinyl-Chloride (PVC) Roofing	10 yrs
076200	Sheet Metal Work	10 yrs
079200	Joint Sealers	10 yrs
084413	Structural Sealant Glazed Curtain Walls	10 yrs
088000	Glass & Glazing	5 yrs coated glass 5 yrs laminated glass 10 yrs insulated glass
096813	Carpet Tile	2 yrs
104000	Signage	1 yr.
112600	Unit Kitchen	1 yr overall unit 4 yrs refrigeration system
122413	Window Shades	5 yrs
142400	Hydraulic Elevators	12 months
223436	Plumbing Hot Water Heaters	5 yrs
238126	Ductless Split Air Conditioning Units	1 yr overall unit

		6 yrs compressors
233516	Vehicle Exhaust System	3 yrs
263213	Standby Power Generator	12 mos.
280000	Security Systems	1 yr.
329100	Planting	18 mos.

(3) **Application:** The obligations under the warranty for the periods specified above shall apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

(4) **Other Provisions:** The warranty requirements set forth in this Schedule B are also included in the Specifications.

- (a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall take precedence.
- (b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, shall remain in full force and effect.
- (c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.
- (d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.

SCHEDULE C

Contract Drawings

(Reference: Article 1.04(A) of the General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

<u>NUMBER</u>	<u>SHEET TITLE</u>
T-0	TITLESHEET
T-1	NOTES & ACCESSIBILITY
T-2	BUILDING CODE & EGRESS DIAGRAMS
T-3	ZONING
—	TOPOGRAPHICAL MAP
—	UTILITY TUNNEL LOCATION & ELEVATION
—	RECORD OF BORINGS (1 OF 3)
—	RECORD OF BORINGS (2 OF 3)
—	RECORD OF BORINGS (3 OF 3)
D-0	SITE DEMOLITION PLAN
AR-1	ASBESTOS ABATEMENT & GENERAL NOTES
AR-2	ASBESTOS ABATEMENT PLAN
AR-3	ASBESTOS ABATEMENT DETAIL SHEET
SV-1	SOIL VAPOR MITIGATION SYSTEM
SV-2	SOIL VAPOR MITIGATION DETAILS
C-1	SITE DRAINAGE PLAN
C-2	DRAINAGE DETAILS
L-0	SITE MATERIALS / PLANTING PLAN
L-1	SITE LAYOUT
L-2	SITE GRADING
L-3	RETAINING WALL & FENCE
L-4	LANDSCAPE DETAILS
L-5	LANDSCAPE DETAILS
BPP-0	BUILDERS PAVEMENT PLAN
BPP-1	BUILDERS PAVEMENT PROFILES
A-1.0	PLAN, BASEMENT LEVEL EAST
A-1.1	PLAN, BASEMENT LEVEL WEST
A-1.2	PLAN, LEVEL 1 EAST
A-1.3	PLAN, LEVEL 1 WEST
A-1.4	PLAN, LEVEL 2 EAST
A-1.5	PLAN, LEVEL 2 WEST
A-1.6	ROOFPLAN, EAST
A-1.7	ROOFPLAN, WEST
A-2.0	RCP, LEVEL 0 & LEVEL 1 EAST
A-2.1	RCP, LEVEL 1 WEST
A-2.2	RCP, LEVEL 2 EAST
A-2.3	RCP, LEVEL 2 WEST
A-3.0	EXTERIOR ELEVATIONS NORTH
A-3.1	EXTERIOR ELEVATIONS SOUTH
A-3.2	EXTERIOR ELEVATIONS EAST-WEST
A-3.3	FENESTRATION DRAWING
A-3.4	CURTAIN WALL DETAILS & GLAZING SCHEDULE
A-4.0	LATERAL SITE SECTION
A-4.1	LATERAL SECTIONS

A-4.2	LATERAL SECTIONS
A-4.3	LATERAL SECTIONS
A-4.4	LOBBY SECTION SOUTH
A-4.5	LOBBY SECTION NORTH
A-4.6	LONG SECTION
A-4.7	LONG SECTION
A-5.0	WALL SECTIONS
A-5.1	WALL SECTIONS
A-5.2	ROOFING DETAILS
A-5.3	ROOFING DETAILS
A-6.0	EXTERIOR DETAILS – SECTION
A-6.1	EXTERIOR DETAILS – SECTION
A-6.2	EXTERIOR DETAILS – PLAN
A-6.3	EXTERIOR DETAILS – PLAN
A-6.4	CONCRETE ELEVATIONS – LANDSCAPE
A-6.5	CONCRETE ELEVATIONS – EXTERIOR
A-6.6	CONCRETE ELEVATIONS – EXTERIOR
A-6.7	CONCRETE ELEVATIONS – INTERIOR APPARATUS
A-6.8	CONCRETE ELEVATIONS – STAIR & DETAILS
A-6.9	CONCRETE ELEVATIONS – INTERIOR & MISC
A-7.0	FLOORING PLANS & FINISH SCHEDULE
A-7.1	FURNITURE & FINISH SCHEDULE, LEVEL 1
A-7.2	FURNITURE & FINISH SCHEDULE, LEVEL 2
A-8.0	INTERIOR ELEVATIONS, PUBLIC
A-8.1	INTERIOR ELEVATIONS, LEVEL 1
A-8.2	INTERIOR ELEVATIONS, APPARATUS
A-8.3	INTERIOR ELEVATIONS, LEVEL 2
A-9.0	INTERIOR DETAILS
A-9.1	INTERIOR DETAILS & DOOR SCHEDULE
A-9.2	INTERIOR DETAILS, STAIR
A-9.3	TYPICAL WALL TYPES
A-9.4	ELEVATOR
A-9.5	ELEVATOR, DIAGRAMS & NOTES
A-9.6	ELEVATOR CAB
A-9.7	EXTERIOR SIGNAGE
A-9.9	INTERIOR GLAZING DETAILS
VE-1	VEHICLE EXHAUST SYSTEM
VE-2	VEHICLE EXHAUST SYSTEM

SITework

<u>NUMBER</u>	<u>SHEET TITLE</u>
SU-1	SITE UTILITIES PLAN

STRUCTURAL

<u>NUMBER</u>	<u>SHEET TITLE</u>
S-0	FOUNDATION AND BASEMENT PLAN
S-1	FOUNDATION AND BASEMENT PLAN
S-2	LEVEL 1 FRAMING PLAN
S-3	LEVEL 1 FRAMING PLAN
S-4	LEVEL 2 FRAMING PLAN

S-5	LEVEL 2 FRAMING PLAN
S-6	LOW ROOF FRAMING PLAN
S-7	LOW ROOF FRAMING PLAN
S-8	HIGH ROOF FRAMING PLAN
S-9	HIGH ROOF FRAMING PLAN
S-10	PARAPET ROOF FRAMING PLAN
S-11	PARAPET ROOF FRAMING PLAN
S-12	NOTES
S-13	NOTES AND LOADING SCHEDULES
S-14	TYPICAL FOUNDATION DETAILS
S-15	TYPICAL PILE CAP DETAILS & FDN. SECTIONS
S-16	FOUNDATION SECTIONS
S-17	FOUNDATION SECTIONS
S-18	TYPICAL FRAMING DETAILS
S-19	TYPICAL FRAMING DETAILS
S-20	TRUSS ELEVATIONS & TYP. DETAILS
S-21	FRAM ELEV., COLUMN SCHEDULE, & TYP. DETAILS
S-22	CONCRETE WALL ELEVATIONS
S-23	FRAMING SECTIONS
S-24	SECTIONS
S-25	SECTIONS
S-26	RETAINING WALL SECTIONS
S-27	SECTIONS
S-28	DETENTION TANK PLANS & DETAILS

PLUMBING

<u>NUMBER</u>	<u>SHEET TITLE</u>
P-0	DOMESTIC WATER/GAS - BSMT FLR PLAN EAST
P-1	DOMESTIC WATER/GAS - LEVEL 1 FLR PLAN EAST
P-2	DOMESTIC WATER/GAS - LEVEL 1 FLR PLAN WEST
P-3	DOMESTIC WATER/GAS - LEVEL 2 FLR PLAN EAST
P-4	DOMESTIC WATER/GAS - LEVEL 2 FLR PLAN WEST
P-5	PLUMBING - ROOF PLAN EAST
P-6	PLUMBING - ROOF PLAN WEST
P-7	SANITARY DRAIN BASEMENT EAST
P-8	SANITARY DRAIN BASEMENT WEST
P-9	SANITARY DRAIN LEVEL 1 FLR PLAN EAST
P-10	SANITARY DRAIN LEVEL 1 FLR PLAN WEST
P-11	SANITARY DRAIN LEVEL 2 FLR PLAN EAST
P-12	SANITARY DRAIN LEVEL 2 FLR PLAN WEST
P-13	DOMESTIC WATER RISE DIAGRAM
P-14	GAS RISER DIAGRAM
P-15	SANITARY & STORM DRAIN RISER DIAGRAM
P-16	PLUMBING DETAILS, SCHEDULE, NOTES & SYMBOLS

FIRE PROTECTION & HVAC

<u>NUMBER</u>	<u>SHEET TITLE</u>
SP-0	SPRINKLER BASEMENT PLAN EAST
SP-1	SPRINKLER LEVEL 1 PLAN EAST
SP-2	SPRINKLER LEVEL 1 PLAN WEST

SP-3	SPRINKLER LEVEL 2 PLAN EAST
SP-4	SPRINKLER LEVEL 2 PLAN WEST
SP-5	SPRINKLER DETAILS
H-0	HVAC BASEMENT PLAN EAST
H-1	HVAC LEVEL 1 PLAN EAST
H-2	HVAC LEVEL 1 PLAN WEST
H-3	HVAC LEVEL 2 PLAN EAST
H-4	HVAC LEVEL 2 PLAN WEST
H-5	HVAC ROOFPLAN EAST
H-6	HVAC ROOFPLAN WEST
H-7	HVAC DETAIL SHEET #1
H-8	HVAC DETAIL SHEET #2
H-9	HVAC SCHEDULES, SYMBOLS, ABBREVIATIONS, & NYC VENT INDEX

ELECTRIC

<u>NUMBER</u>	<u>SHEET TITLE</u>
E-0	ELEC – BASEMENT PLAN
E-1	ELEC – PWR LEVEL 1 PLAN EAST
E-2	ELEC – PWR LEVEL 1 PLAN WEST
E-3	ELEC – PWR LEVEL 2 PLAN EAST
E-4	ELEC – PWR LEVEL 2 PLAN WEST
E-5	ELEC – PWR ROOFPLAN EAST
E-6	ELEC – PWR ROOFPLAN WEST
E-7	ELEC – LIGHTING LEVEL 1 PLAN EAST
E-8	ELEC – LIGHTING LEVEL 1 PLAN WEST
E-9	ELEC – LIGHTING LEVEL 2 PLAN EAST
E-10	ELEC – LIGHTING LEVEL 2 PLAN WEST
E-11	ELEC – RISER DIAGRAM
E-12	ELEC – SCHEDULE SHEET

FUEL TANK & DISPENSER

<u>NUMBER</u>	<u>SHEET TITLE</u>
F-0	LEGEND AND ABBREVIATIONS
F-1	GENERAL NOTES
F-2	FUEL SYSTEM NOTES
F-3	FUEL SYSTEM SITE PLAN
F-4	TANK SYSTEM CROSS SECTION & DETAILS
F-5	CONCRETE DETAILS
F-6	MISCELLANEOUS DETAILS (1 OF 2)
F-7	MISCELLANEOUS DETAILS (2 OF 2)
F-8	TYP. ELECTRIC & CONTROL SCHEMATIC

SECURITY

<u>NUMBER</u>	<u>SHEET TITLE</u>
SEC-0	SECURITY PART PLAN-SITE
SEC-1	LEVEL 1 - EAST
SEC-2	LEVEL 1 - WEST
SEC-3	LEVEL 2 – EAST

SEC-4 LEVEL 2 - WEST
SEC-5 RISER & DETAILS

SCHEDULE D

Electrical Motor Control Equipment

(Reference: Article 1.37, Part K of the General Conditions)

Requirements for electrical motor equipment may be included in one or more sections of the Specifications for the Contract for the Project. Schedule D set forth below delineates specific information for electrical motor control equipment. In the event of any conflict between the Specifications and this Schedule D, Schedule D shall take precedence; provided, however, in the event of an omission from Schedule D (i.e., Schedule D omits either a reference to or information concerning electrical motor equipment which is set forth in the Specifications), such omission from Schedule D shall have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, shall remain in full force and effect.

Legend for Control Type

DB Disconnect Circuit Breaker (Switch)
TS Thermal Switch
MS Magnetic Starter
CMS Comb. Mag. Starter

P Pilot Light
F Firestat
T Thermostat
AL Alternator

BG Break Glass Station
HOA Hand-Off Auto.
PB Push Button Station
RO Remote "off"

Equip. Ident.	Location	# of Units	HP or KW	Volts and Phase	Control Type: See legend above	Remarks:
RTU-1&2	Roof	2	6	208/3	DB,T	
RTU-3,4,5,6	Roof	4	5	208/3	DB,T	
ACC-1	Roof	1	8	208/3	DB	
AC-1-1,2,3,&4	First Floor	4	1	208/1	DB,T	
AC-2-1&2	Second Floor	2	1 1/2	208/1	DB,T	
EF-1	Roof	1	1	208/3	DB,TS	
EF-2	Roof	1	1/2	120/1	DB,TS	
EF-3A&3B	Apparatus Floor	2	1 1/2	208/3	DB,TS,HOA	
EF-5	SE Entry	1	1/12	120/1	DB,TS,HOA	
EF-6	Elec Room	1	1/12	120/1	DB,TS,HOA	
EF-7	Gas Room	1	1/6	120/1	DB,TS,HOA	

UH-1 to UH-4	Apparatus Floor	4	1/4	120/1	DB,T	
HWH-1&2	First Floor	2	Fract.	120/1	DB	
HW Circ Pump	First Floor	1	Fract.	120/1	DB,TS	
Sump Pump	Elevator Pit	1	1/3	120/1	DB,TS,CMS	
Nederman EF-8	Roof	1	10	208/3	DB,CMS,HOA	
Elevator		1	20	208/3		
Garage Doors	Apparatus bay	3	2 1/2	208/3	DB,PB,CMS	
HWH-3	Apparatus bay	1	2	208/1	DB	

SCHEDULE E

Separation of Trades

(Reference: Article 1.40 of the General Conditions)

NOT USED

SCHEDULE F

Shop Drawing and Material Samples Schedule

(Reference: Article 1.41 of the General Conditions)

The Schedule set forth below lists all submittal requirements for the Contract. In the event of any conflict between the Specifications and this Schedule F, Schedule F shall take precedence; provided, however, in the event of an omission from Schedule F (i.e., Schedule F omits either a reference to or information concerning a submittal requirement which is set forth in the Specifications), such omission from Schedule F shall have no effect and the Contractor's submittal obligation, as set forth in the Specifications, shall remain in full force and effect.

CONSULTANT: Dean/Wolf Architects
 TELEPHONE NUMBER: 212.385.1170
 DDC PROJECT MANAGER: Ben Perez
 TELEPHONE NUMBER: 718.391.2198

DATE: _____

APPROVED: _____
 (DDC RESIDENT ENGINEER/CPM)

REPORT DATE		FMS ID #/PROJECT ID #: F175 Queen CONTRACT REGISTRATION #: 20050023361 PROJECT NAME: EMS Station 50					CONTRACT #: 1 TRADE: General Construction SHOP DRAWING LOG SHEET #					USE SEPARATE SHEET FOR EACH TRADE				
SPEC. SECT. #	DESCRIPTION	COORD. WITH CONTR.	SUBMITTAL			SUB. DATE	REQ'D DEL.	FABRIC. TIME	SUBMISSIONS							
			SHOP DWG.	SAMPLE	CAT. CUTS				REC'D	RET'D	ACTION	REC'D	RET'D	ACTION		
033000	Concrete		X		X											
033300	Architectural Concrete		X	X + MOCK UP	X											
051200	Structural Steel		X	X + MOCK UP	X											
053000	Metal Decking		X	X	X											
054000	Cold Formed Metal Framing		X	X	X											
055000	Miscellaneous Metals		X	X	X											
042000	Unit Masonry		X	X	X											

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APPENDIX A**GEOTECHNICAL DOCUMENTS**

- 1 Report of Geotechnical Investigation prepared by Future Tech Consultants of New York, Inc. Jan. 27, 2006 Re: Foundation recommendations for new building.
- 2 Utility Investigation prepared by Matrix Engineering Services, PC Jan. 11, 2006 Re: Geoprobes to locate top of existing utility tunnel.
- 3 Report of Geotechnical Investigation prepared by Future Tech Consultants of New York, Inc. Oct. 31, 2006 Re: Parking lot paving and retaining wall foundations.
- 4 Memo to Report of Geotechnical Investigation prepared by Future Tech Consultants of New York, Inc. Dec. 20, 2006 Re: Minimum distance of new piles to existing tunnel
- 5 Memo to Report of Geotechnical Investigation prepared by Future Tech Consultants of New York, Inc. Feb. 13, 2007 Re: foundation recommendations for fuel tank and storm water detention tank.
- 6 Site Visit Report prepared by Future Tech Consultants of New York, Inc. August 10, 2007 Re: Visual inspection of existing tunnel condition.
- 7 Soil Characterization of Formaldehyde Contamination, prepared by LiRo Engineers, Inc. May 30, 2007

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**SECTION 011100
SUMMARY OF WORK**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract apply to this section.

1.2 ENVIRONMENTAL WORK DESCRIPTION:

A. General

This section specifically addresses the management and disposal of contaminated soil which will be encountered at the FDNY Queens EMS Station project site. The General Construction Contractor (Contractor) will be responsible for the following: excavation and disposal of contaminated soil; development and implementation of a health and safety plan protective of all site workers (including all other contractors) and the public. A summary of known site environmental conditions is included in Appendix A attached herein. The site data are provided for informational purposes, however, actual conditions may vary and NYCDDC does not represent that the Appendix A data fully characterizes site conditions. The Contractor is responsible for performing excavation work, characterizing all wastes, and disposing in accordance with all regulations. A general description of the work is provided as follows:

1. Develop a Site-Specific Health and Safety Plan

The Contractor shall develop and implement a site-specific Health and Safety Plan (HASP) or shall provide the services of an environmental consultant to develop and implement a site-specific HASP. The HASP shall address all site activities (including those to be completed by other contractors) that may result in exposure of site workers or the public to potentially toxic or hazardous substances. The Contractor must provide a full time site health and safety officer to oversee activities of all onsite personnel, including personnel of other contractors, to ensure compliance with health and safety requirements, as well as provide environmental compliance and personal exposure sampling and laboratory analysis. All costs for development and implementation of the HASP are to be included in the Contractor's lump sum bid price. NYCDDC will make no additional payment (beyond the line item bid) for implementation costs such as medical monitoring, personal protective equipment (PPE), etc..

2. Non-hazardous Contaminated Soil

- a. Currently available analytical data, suggests that contamination including, but not limited to, used formalin (formaldehyde), VOCs, SVOCs and metals exist in soils as discussed in Appendix A. However, the contamination may not be confined to this area. Contaminated soil may be encountered during subsurface activities including, but not limited to, pile and pile cap installation, utility excavations, general earth excavation, foundation work, storm water retention tank and motor fuel tank installation and other work requiring removal or disturbance of existing soils. In order to ensure that contaminated soils are disposed of properly, all excavated soils or soils generated from site activities within the limits of

excavation shall be stockpiled on site for sampling and characterization analysis by the Contractor prior to removal from site. The Contractor shall include all excavation, stockpiling and loading/hauling costs of VOC, SVOC and metals contaminated soils within the limits of excavation in his lump sum bid price. Disposal of non-hazardous used formalin (formaldehyde) contaminated soils shall be disposed of at the bid price as specified in Paragraph 1.02 A.1 c.

- b. The Construction Manager is responsible for sampling and laboratory characterization of all soil resulting from excavation/grading activities. The Contractor shall provide access, and/or assist as necessary, the Construction Manager or Construction Managers representative in the collection of samples.
- c. The bid sheet includes line items for disposal of non-hazardous used formalin (formaldehyde) contaminated soils within the limits of excavation. Non-hazardous used formalin (formaldehyde) contaminated soils are anticipated to be encountered below an elevation of 93.5 feet. Refer to Contract Drawings for elevations. The Contractor shall include all excavation, stockpiling and loading/hauling costs of non-hazardous used formalin (formaldehyde) contaminated soils within the limits of excavation in his line item bid price.
- d. The bid sheet includes line items for disposing of non-hazardous contaminated soil outside the limits of excavation. The Contractor shall conduct over excavations of soils outside the limits of excavation as directed and approved by the Construction Manager. The Contractor shall excavate, stockpile excavated material, sample, transport and dispose of the additional excavated material at the unit bid price.
- e. The Contractor and/or any other Contractors involved in operations that disturb or potentially disturb contaminated soils or in the excavation of contaminated soils shall be required to do so in accordance with an approved Health and Safety Plan. Project Contractors will be afforded the option of either adopting the Contractor's approved HASP or submitting their own HASP to the Construction Manager for approval.
- f. The Contractor is responsible for decontamination-related wastes including, but not limited to, rinse water, sediment, and spent PPE including such materials generated by other Contractors. All soil and wastes must be treated and/or disposed of in an environmentally safe manner in accordance with all applicable Federal, State, and local regulations.

B. General Documentation Requirements

Prior to any excavation activities, the Contractor shall submit all approvals to the Construction Manager. All approvals shall be prepared by, stamped and sealed by a Professional Engineer licensed by the State of New York, as appropriate. The Contractor must also provide documentation that the work was performed in accordance with current New York State and local regulations. Required documentation is detailed in the specifications and includes, but is not limited to:

- Copies of State and City regulatory agency permits
- Copies of any reports prepared relating to hazardous materials

- Copies of all correspondence with outside governing agencies
- Copies of all approved permits, shop drawings and submittals
- Copies of all transported soil manifests and disposal records including the results of all analytical testing required for transportation and disposal

1.3 QUALIFICATIONS:

The Contractor and or any subconsultant will demonstrate its ability to perform and complete all required work by submitting a statement of its experience and the experience of any environmental subconsultant which the Contractor intends to use to perform the work.

END OF SECTION

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**SECTION 014100
REGULATORY REQUIREMENTS**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENT

- A. This section sets forth codes, regulations, and industry standards which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which must either be applied for and received, or must be given to governmental agencies before start of work.
- B. The Contractor and all other contractors and subconsultants must adhere to work practices and procedures set forth in applicable codes, regulations, and standards.
- C. The Contractor must obtain permits, licenses, inspections, releases, and similar documentation, as well as complete payments, statements, and similar requirements associated with codes, regulations, and standards.

1.2 CODES AND REGULATIONS:

- A. General Applicability of Codes, Regulations, and Standards. The requirements of all applicable codes, regulations, and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- B. Contractor Responsibility. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and local regulations pertaining to work practices, transportation, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor and other contractors/subconsultants are responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and local regulations.
- C. All work performed under this contract will comply with applicable provisions, including the most current versions, and is not limited to the listed codes and regulations.

1.3 REGULATIONS:

Regulations which govern contaminated waste site operations work or hauling and disposal of waste materials include, but are not limited to, the following:

Safety and Health, under authority of U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), including, but not limited to:

Respiratory Protection (29 CFR 1919.134 and 29 CFR 1910.103)
Hazardous Waste Operations & Emergency Response (29 CFR 1910.120)
OSHA - Construction Industry (29 CFR 1926)
Occupational Noise Exposure (29 CFR 1910.95)

Air Contaminants (29 CFR 1910.1000)
OSHA – Formaldehyde (29 CFR 1910.1048)
Access to Employee Exposure and Medical Records (29 CFR 1910.2)
Hazard Communication (29 CFR 1910.1200)
Specifications for Accident Prevention Signs and Tags (29 CFR 1910.145)
Temperature Extremes (29 CFR 1910.120)
Confined Space Entry (29 CFR 1910.146)
Control of Hazardous Energy (lockout/tagout) (29 CFR 1910.147)
Trenching and Excavating (29 CFR 1926.652)
Eye Protection (29 CFR 1910.5)
Spills and Releases (29 CFR 1910.12 and 40 CFR 311)
Fall Protection (29 CFR 1910.66 and 29 CFR 1926.500)
EPA “General Provisions” (40 CFR Subpart A)

- A. Transportation under authority of U.S. Department of Transportation, including, but not limited to, the following:

Hazardous Substances
Title 29, Part 171 and 172 of the Code of Regulations

- B. Environmental Protection under the authority of the U.S. Environmental Protection Agency (EPA), including, but not limited to, the following:

Hazardous Waste Management Systems: General (40 CFR 260)
Identification and Listing of Hazardous Waste (40 CFR 261)
Generators of Hazardous Waste (40 CFR 262)
Transporters of Hazardous Waste (40 CFR 263)
Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (40 CFR 264, 265)
Land disposal Restrictions (40 CFR 268)
Clean Air Act of 1990 (as amended)
Clean Water Act of 1972 (as amended)
Hazardous Waste Shipping Regulations (49 CFR 171-179)

1.4 STATE AND LOCAL REGULATIONS:

State regulations include requirements of NYS Department of Health, NYC Department of Environmental Protection, and NYS Department of Environmental Conservation Part 370 Hazardous Waste Management and Part 360 Solid Waste Management rules and referenced rules which are cited in the Specific Sections to which the regulations pertain. Also incorporated into this specification are the requirements of the “Rules of the City of New York (RCNY)”, Title 1 (Department of Buildings), Title 15 (Department of Environmental Protection), Title 16 (Department of Sanitation), Title 24 (Department of Health), and Title 34 (Department of Transportation).

1.5 STANDARDS:

- A. The requirements of all applicable standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

- B. The Contractor shall assume full responsibility and liability for the compliance with all standards pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. Several sources of standards are listed below. The Contractor and Contractors will hold NYCDDC and Construction Manager harmless for failure to comply with any applicable standards on the part of himself, his employees, or his subcontractors.

American National Standards Institute (ANSI)
1430 Broadway
New York, NY 10018
(212) 354-3300

Practices for Respiratory Protection Publication Z88.2-1980
American Society for Testing and Materials (ASTM)
100 Bar Harbor Drive
W. Conshohocken, PA 19428-2959
(610) 832-9585

1.6 INDUSTRY STANDARDS:

- A. Except where Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual sections indicate which codes and standards that site contractors must keep at the Project Site for reference.
- B. Referenced industry standards take precedence over standards that are not referenced but recognized in the construction industry as applicable.

1. Publication Dates

Where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.

2. Conflicting Requirements

Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced. Refer requirements that are different but apparently equal, and uncertainties as to which level is more stringent, to NYCDDC and Construction Manager for a decision before proceeding.

3. Minimum Quantities or Quality Levels

In every instance the quantity or quality level shown or specified will be the minimum to be provided or performed. In complying with these requirements, indicated numeric values are minimum or maximum values as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to NYCDDC and Construction Manager for decision before proceeding.

1.7 PERMITS:

The Contractor shall secure all necessary permits and approvals by the appropriate agencies and/or NYCDDC and Construction Manager as required for the proper transportation of materials on or off site. The Contractor shall also secure NYCDEP and NYSDEC discharge permits and approvals for any dewatering activities. The Contractor and any contractor involved in such work will be required to issue confined space entry permits for entry into confined spaces. The Contractor will prepare and submit copies of all regulatory notifications and/or permit/authorization applications to NYCDDC and Construction Manager.

1.8 LICENSES:

The Contractor shall maintain current licenses as required by applicable state and local jurisdictions for the removal, transporting, disposal of soils, or other regulated activity relative to the work of this contract.

1.9 NOTIFICATIONS:

The Contractor shall post all notices required by applicable federal, state and local regulations at the job site.

1.10 ENVIRONMENTAL PROTECTION REQUIREMENTS:

- A. The Contractor shall provide and maintain environmental protection, as defined, for the entire duration of the contract.
- B. The Contractor shall plan for and provide environmental protective measures to control pollution that develops during normal construction practice.
- C. The Contractor shall plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project.
- D. The Contractor shall comply with federal, state and local regulations pertaining to the environment, including but not limited to, water, air, soil, and noise pollution.

1.11 PROTECTION OF NATURAL RESOURCES:

- A. The Contractor shall preserve the natural resources within the project boundaries and outside the limits of permanent work.
- B. The Contractor shall restore the natural resources within the project boundaries and outside the limits of permanent work to an equivalent or improved condition upon completion of work.
- C. The Contractor shall confine decontamination activities to within the limits of the work area indicated or specified.

1.12 WATER RESOURCES:

- A. The Contractor shall prevent all wastes and sediment from uncontrolled release into drainage areas, sewers, or local bodies of water.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

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**SECTION 026100
REMOVAL AND DISPOSAL OF CONTAMINATED SOILS**

PART 1 - GENERAL

1.1 SCOPE OF WORK:

- A. This section describes the minimum requirements for handling, transportation, and disposal of contaminated materials. Other material handling, excavation, and backfill requirements are governed by the general Contract Documents.
- B. Currently available analytical data, suggests that contamination exist in soils as discussed in Appendix A. However, the contamination may not be confined to this area. Contaminated soil may be encountered during subsurface activities including, but not limited to, pile and pile cap installation, utility excavations, general earth excavation, foundation work, detention tank and motor fuel tank installation and other work requiring removal or disturbance of existing soils. In order to ensure that contaminated soils are disposed of properly, all excavated soils or soils generated from site activities within the limits of excavation shall be stockpiled on site for sampling and characterization analysis by the Contractor prior to removal from site. The Contractor shall include all excavation, stockpiling and loading/hauling costs of soils within the limits of excavation in his lump sum bid price.
- C. The Construction Manager is responsible for sampling and laboratory characterization of all soil resulting from excavation/grading activities. The Contractor shall provide access, and/or assist as necessary, the Construction Manager or Construction Managers representative is the collection of samples.
- D. The bid sheet includes line items for disposing of non-hazardous contaminated soil outside the limits of excavation. The Contractor shall conduct over excavations of soils outside the limits of excavation as directed and approved by the Construction Manager. The Contractor shall excavate, stockpile excavated material, sample, transport and dispose of the additional excavated material at the unit bid price.
- E. The work covered by this specification includes the handling, staging, transport and disposal of contaminated materials excavated and stockpiled throughout the project area, including contaminated soils generated during subsurface activities including, but not limited to, pile and pile installation, utility excavations, general earth excavation, foundation work, detention tank and motor fuel tank installation and any associated incidental work as deemed appropriate by the Construction Manager. The Contractor is responsible for the proper disposal of all equipment decontamination rinse waters. All work will be conducted in accordance with all applicable federal, state and local regulations and the provisions of this and accompanying specifications.

1.2 REFERENCES:

The publications listed below are incorporated into this specification and will be read as if printed herein. In the case of conflict between the referenced documents and the following text, the stricter requirements will apply.

- A. American Society for Testing and Materials (ASTM) Publications

D 3587-85 Classification of Soils for Engineering Purposes

B. Code of Regulations (CFR)

40 CFR 260 Through 270 EPA's Hazardous Waste Requirements
40 CFR 136 Guideline for Establishing Test Procedures for Analysis of
Pollutants

C. U.S. Environmental Protection Agency (EPA)

EPA-SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third
Edition, November 1986

EPA Standard Operating Guide, July 1988

D. Manifesting and Transporting (DOT)

49 CFR Hazardous Materials Transportation Regulations

1.3 CONTRACTOR SERVICES:

The Contractor shall furnish all materials, labor, tools, equipment, utilities, water and fuel supply, vehicular transportation, field log preparation, and necessary incidental services for excavation/removal of contaminated soil. The Contractor will also provide:

1. Stockpile, Remove, transport and disposal of all soils necessary for the completion of the foundation and utility excavation work.
2. Removal, transport and disposal of contaminated stockpile soils;
3. Over-excavation of hot-spot areas beyond the contract required foundation limits if required by site conditions and authorized by Construction Manager.
4. Backfilling over-excavated areas with clean fill.
5. Transport and disposal of all cleaning/decontamination and PPE wastes;.
6. All necessary incidental services not specifically noted but which are required for completion of the specified work; and
7. Environmental reporting. This includes submittal of the following items and their subparts described herein in accordance with technical specification SUBMITTALS:
 - a. Proof of qualification credentials;
 - b. Copies of transport manifests;
 - c. Contaminated stockpiled soil sampling results;
 - d. Logs, reports, and record keeping, as required by the Construction Manager;
 - e. Bills of lading, Certified Weight Tickets.

1.4 REGULATORY REQUIREMENTS:

All work included in this contract will be conducted in strict compliance with all applicable Federal, State and Local regulations, statutes, codes and policies.

1.5 CONTAMINANTS:

Available soil sampling results are furnished in Appendix A. The Contractor must include provisions for the disposal of all project contaminated soils. The Contractor and other contractors shall be prepared to work with any materials as necessary and at all levels of OSHA mandated personal protection. NYCDDC provides Appendix A for information purposes only and does not represent that this data fully characterizes the site conditions.

1.6 PERMITS AND CERTIFICATIONS:

The Contractor shall be responsible for obtaining all of the necessary State and Local permits required for contaminated soil excavation, removal, transport, and disposal. In the event that an EPA/State Waste Site/Generator Identification Number is required for soil transport and disposal, the NYCDDC will be responsible for obtaining the identification number and the Contractor shall be responsible for obtaining the transportation manifest.

1.7 SUPERVISION:

The Contractor shall assign a foreman to be directly responsible for coordinating and directing all work required for the excavation operations.

1.8 MOBILIZATION AND DEMOBILIZATION:

A. The Contractor and other contractors shall mobilize all personnel, supplies, and equipment to the project site. Mobilization will consist of:

1. The delivery to the site of all labor, equipment and materials needed to the job site;
2. Complete assembly in satisfactory working order of all such equipment on the site.
3. All site equipment will be properly decontaminated prior to being delivered to the site.
4. All site equipment will be properly decontaminated prior to being removed from the site. All wastes generated from this decontamination process (i.e. rinse water and sediment) will be characterized and disposed of by the Contractor at no additional cost to the City.

B. Demobilization shall consist of the removal from the site of all equipment and surplus materials after completion of the work. Contractors shall not be reimbursed for costs associated with temporarily vacating the site before completion of work.

1.9 PAYMENT:

A. Contaminated soil may be encountered during subsurface activities including, but not limited to, pile and pile cap installation, utility excavations, general earth excavation, foundation work, storm water retention tank and motor fuel tank installation and other work requiring removal or disturbance of existing soils. In order to ensure that contaminated soils are disposed of properly, all excavated soils or soils generated from site activities within the limits of excavation shall be stockpiled on site for sampling and characterization analysis by the Contractor prior to removal from site. The Contractor shall include all excavation, stockpiling and loading/hauling costs of VOC, SVOC and metals contaminated soils within the limits of excavation in his lump sum bid price. Disposal of non-hazardous used formalin (formaldehyde) contaminated soils shall be disposed of at the bid price as specified in Paragraph 1.09.2

B. The bid sheet includes line items for disposal of non-hazardous used formalin (formaldehyde) contaminated soils within the limits of excavation. Non-hazardous used formalin (formaldehyde)

contaminated soils are anticipated to be encountered below an elevation of 93.5 feet. Refer to Contract Drawings for elevations. The Contractor shall include all excavation, stockpiling and loading/hauling costs of non-hazardous used formalin (formaldehyde) contaminated soils within the limits of excavation in his line item bid price. The Contractor shall be reimbursed according to the unit price bid sheet.

- C. The bid sheet includes line items for disposing of non-hazardous contaminated soil outside the limits of excavation. The Contractor shall conduct over excavations of soils outside the limits of excavation as directed and approved by the Construction Manager. The Contractor shall excavate, stockpile excavated material, sample, transport and dispose of the additional excavated material at the unit bid price. All costs associated with the handling, stockpiling, transportation, sampling and disposal of contaminated materials associated with but not limited to, pile and pile cap installation, utility excavations, general earth excavation, foundation work, detention tank and motor fuel tank installation and other work requiring removal or disturbance of existing soils and incidental to the contract work shall be included in the Contractor's base bid. If additional excavation and disposal of contaminated materials is required, as directed and approved by the Construction Manager, outside of the contract work limits, then the Contractor shall be reimbursed according to the unit price bid sheet.

PART 2 – PRODUCTS

2.1 FORMALDEHYDE GAS DETECTOR

- A. The Contractor shall provide two Formaldehyde Gas Detectors. One for the use by the City's Representative during excavation activities and one for the Contractors use. The Contractor shall provide operational detectors for the duration of the project. The detector utilized by the City's representative shall become the property of the City. Detector shall be a Model FP-30, as manufactured by RKI Instruments of Union City, CA, or approved equal.
- B. The detector shall meet or exceed the following specifications:
- | | | |
|----|----------------------|---|
| a. | Detection Gas: | Formaldehyde |
| b. | Detection Limit: | 0-1.0 ppm |
| c. | Detection Time: | 15 minutes |
| d. | Detection Principle: | Photoelectronic Photometry Method |
| e. | Sampling Method: | Sample drawing with built-in pump |
| f. | Self-diagnosis: | Failure of light source and light receiver, low battery voltage, pump failure, system trouble |

- C. The Contractor shall provide all repair, replacement parts, batteries and detection TABs required for the duration of the project

PART 3 - EXECUTION

3.1 REMOVAL OF CONTAMINATED SOIL STOCKPILES, EXCAVATED MATERIALS AND ASSOCIATED BERM/CONTAINMENT STRUCTURES:

- A. The Contractor shall ensure that soil is accepted for disposal at a permitted facility in accordance with applicable New York City, State and Federal regulations. The Contractor shall dispose of soils at a facility which is permitted by the New York State Department of Environmental Conservation or governing body, to accept such materials. In the event that the soils are sent to

an out-of-state disposal facility the Contractor shall sample and characterize the soils to ensure compliance with the proposed disposal facilities permit requirements. The Contractor shall secure all permits required in connection thereof and provide the Construction Manager with all documentation regarding the disposal of such soil.

- B. The Contractor shall remove and transport contaminated soil as necessary.
- C. The Contractor shall ensure that all materials are secured during transport.
- D. The Contractor shall obtain and submit two (2) copies of all transport manifests, bills of lading, and certified weight tickets for recycling and/or disposal of all materials to the Construction Manager within 3 calendar days of transport of any material. Soils shall be transported to a permitted facility for treatment and/or disposal. Receipts shall indicate at a minimum the following information: date, time, driver, remediation or recycling facility, quantity and type of material delivered, facility permit number, as appropriate, and roundtrip travel mileage from the work site to the facility.
- E. The Contractor shall be solely responsible to verify that contaminated soils have been treated and disposed of in an environmentally safe and responsible manner in accordance with all applicable Federal, State or Local requirements. At a minimum, if soil testing indicates the excavation material is not hazardous, based on the known contaminants present these wastes must be disposed of at a sanitary or industrial landfill permitted to receive such wastes. If the soil to be treated is a State or Local hazardous or dangerous waste, the Contractor shall coordinate with the Construction Manager for any special disposal and transportation requirements. The Contractor shall use either a permitted disposal facility or other permitted treatment facility to dispose of contaminated soils. Contaminated soil shall not be disposed of on-site. Final soil deposition at a permitted facility must be documented by disposal manifests. All chain of custody information, including soil quantity delivered, facility location and phone number, and the method of disposal must be included.
- F. For stock piling of soils, the Contractor shall ensure during all stages of field work that the contaminated soil is properly isolated from the surrounding environment to prevent contamination migration. The Contractor shall at no time leave stockpiled materials uncovered and unattended. The Contractor shall replace, secure and maintain soil containment structures (berming, poly sheeting, hold down tires, etc.) whenever the site is left unattended, until such time as the entire quantity of stockpiled material is safely removed and the site has met final restoration requirements. The Contractor shall maintain stockpiles until removal. Stockpiles shall be removed prior to final completion.
- G. Berms shall be constructed around stockpiled materials to contain contaminated soils and to prevent contamination from migrating. The Contractor shall inspect the berms for integrity at the start of each day. In the event that damage to the berms is identified, the Contractor will notify the Construction Manager immediately. The Contractor shall maintain the existing berms at a minimum height and thickness of one foot for the duration of construction. Trenches are not an acceptable substitute for berms.
- H. All stockpiled soils shall be secured against contamination migration due to wind, rain, etc. through the use of polyethylene liners and covers. The Contractor shall inspect the integrity of the polyethylene and any existing stockpiles upon arrival at the site. In the event that damage to the polyethylene lining or cover is identified, or the liner or cover is not present, the Contractor shall notify the Construction Manager immediately. If the Contractor's activities, prior to start of removal of soil, including operation of equipment on liners and/or covers, damages plastic or

polyethylene liners or covers, the Contractor shall be responsible for replacement of liners and/or covers. Stockpiled material shall be placed on the top of 20-mil polyethylene sheeting and covered with 6-mil polyethylene sheeting. Sheeting shall be weighted or secured by the Contractor using appropriate means as approved by the Construction Manager. If more than one continuous piece of plastic is used for the liner or cover, it will be sealed at the edges with an appropriate sealer (duct tape, etc.). The liner and cover will be sufficiently larger than the areas of stored soil to cover the stored soil plus two feet of excess on all sides.

- I. The Contractor shall be responsible for all work associated with removal, transport and disposal and/or final deposition of soil containment structures. The Contractor shall stockpile separately uncontaminated soils used for constructing berm containment structures.

3.2 SAMPLING OF EXCAVATION LIMITS:

- A. A representative of the City will conduct field screening of excavations to determine final excavation limits and locations for soil sample collections. Field screening shall be conducted with a Formaldehyde Gas Detector. The Contractor shall purchase the Formaldehyde Gas Detector and provide such detector to the Representative of the City for use on the project. The Formaldehyde Gas Detector shall meet the requirements of Part 2 – Products and shall become the property of the City following project completion. The Contractor shall provide an additional detector for the Contractor's use during excavation. The additional detector shall remain the property of the Contractor following project completion.
- B. The Representation of the City will field screen and sample excavation side walls and bottoms for characterization of residual contamination. Where present, samples shall be taken from any area that appears to be visually contaminated. The Contractor may be directed to over excavate areas of contamination which are greater than the foundation excavation limits shown in the General Contract Drawings. This additional work will be performed at the Contractor's bid unit rates.
- C. The Contractor supplied independent laboratory shall analyze the soil samples for the following:
 - a) Formaldehyde
 - b) Total SVOC
 - c) Total VOC

Maximum turn-around time for shipping, analysis and receipt of results (to the Construction Manager) shall be 5 days from the date of the sample collection.

Contractor shall supply an independent laboratory for analysis of City collected excavation limit samples. All expenses related to the packing, shipping, and analysis of excavation limit samples shall be included in the Contractor's base bid.

3.3 DISPOSAL CHARACTERIZATION

The Contractor shall collect soil samples as required for disposal characterization. Minimum soil sample frequency shall be one sample per 1,000 cubic yards or as required by the disposal facility. The Contractor shall package and ship soil samples to an approved independent laboratory. All expenses related to collection, packaging, shipping and analysis of soil samples shall be the responsibility of the Contractor and included in the Contractor's base bid.

3.4 EXCAVATION HOLE SECURITY:

The Contractor shall place barricades or fencing around the excavation holes any time the site is left unattended until such time as the excavation hole is backfilled to the original surface level.

All personnel exposure and medical monitoring records will be maintained in accordance with applicable OSHA standards, 29 CFR 1910 and 1926 (including OSHA 200 log and accident/first aid reports).

3.5 BACKFILLING OF EXCAVATION

- A. The Contractor shall backfill and compact fill materials in accordance with the general Contract Documents. The Contractor shall not backfill excavations without approval of the Construction Manager following receipt and review of the endpoint sampling laboratory analysis.
- B. Backfill materials in landscaped areas shall be NYSDEC TAGM certified to be contaminant free.

3.6 DEWATERING OF EXCAVATIONS

- A. The Contractor shall protect excavations from cross-site surface runoff. The Contractor shall provide, install and maintain berms, ditches and other structures as required to protect excavations and existing stormwater structures.
- B. The Contractor shall pump standing water from excavations prior to backfilling or conducting additional work. Collected water shall be containerized for off-site disposal at an approved waste receiver. Contractor shall provide all labor, materials and equipment required for control, collection, containment, treatment, and disposal of accumulated surface water.
- C. All costs associated with the control, collection, containment, treatment and disposal of accumulated surface water shall be included in the Contractor's base bid.

3.7 LOGS, REPORTS, AND RECORD KEEPING:

The following logs, reports, and records will be developed, retained, and submitted to the Construction Manager and/or entitled regulatory agencies upon request (unless otherwise noted in previous sections):

- 1. Training logs including employees' printed names and signatures in addition to training subject and date or copy of applicable training certificate;
- 2. Daily safety inspection logs;
- 3. Employee/visitor/register;
- 4. Medical opinions/certifications;
- 5. Environmental and personal exposure monitoring records;
- 6. Phaseout reports (final documentation verification certificates, summary of air monitoring data, final medical certificates, etc.); and
- 7. A copy of all State licensing certificate required to conduct all required activities.
- 8. Sampling logs and drawings showing sample ID's and locations.

All personnel exposure and medical monitoring records shall be maintained in accordance with applicable OSHA standards, 29 CFR 1910 and 1926 (including OSHA 200 log and accident/first aid reports).

3.8 QUALIFICATIONS:

- A. The Contractor and any environmental subconsultants involved in any activity associated with the management of contaminated soil/water must have at least three years of related experience.
- B. The Contractor and all other site contractors shall provide demonstration that the minimum insurance criteria have been met.

END OF SECTION

SECTION 028013 – GENERAL CONTRACTOR WORK
ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

1.01 SCOPE FOR ASBESTOS ABATEMENT WORK

- A. The "General Conditions" apply to the work of this Section.
- B. The Asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the Asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **\$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.
- C. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE RULES AND REGULATIONS OF THE ASBESTOS CONTROL PROGRAM AS PROMULGATED BY TITLE 15 CHAPTER I OF RCNY AND NEW YORK STATE DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 56 CITED AS 12 NYCRR, PART 56 WHICHEVER IS MORE STRINGENT AS PER LATEST AMENDMENTS TO THESE LAWS AND AS MODIFIED HEREIN BY THESE SPECIFICATIONS.
- D. ALL DISPOSAL OF ASBESTOS CONTAMINATED MATERIAL SHALL BE PER LOCAL LAW 70/85.
- E. THE ASBESTOS ABATEMENT CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT CERTAIN METHODS OF ASBESTOS ABATEMENT ARE PROTECTED BY PATENTS. TO DATE, PATENTS HAVE BEEN ISSUED WITH RESPECT TO "NEGATIVE PRESSURE ENCLOSURE" OR "NEGATIVE-AIR" OR "REDUCED PRESSURE" AND "GLOVE BAG".
- F. THE ASBESTOS ABATEMENT CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND SHALL HOLD THE DEPARTMENT OF DESIGN AND CONSTRUCTION AND THE CITY HARMLESS FROM ANY AND ALL DAMAGES, LOSSES AND EXPENSES RESULTING FROM ANY INFRINGEMENT BY THE ASBESTOS ABATEMENT CONTRACTOR OF ANY PATENT, INCLUDING BUT NOT LIMITED TO THE PATENTS DESCRIBED ABOVE, USED BY THE ASBESTOS ABATEMENT CONTRACTOR DURING PERFORMANCE OF THIS AGREEMENT.
- G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

- H. Prior to starting, the Asbestos abatement contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the Work as required by these Specifications. The Asbestos abatement contractor is responsible to prepare and submit all filings, notifications, etc. required by all City, State and Federal regulatory agencies having jurisdiction.

The Asbestos abatement contractor is responsible for submitting the Asbestos Project Notification Form (ACP-7 Form) to the Department of Environmental Protection, Asbestos Control Program, as per Title 15, Chapter I of RCNY and to the NYSDOL as per Industrial Code Rule 56.

The Asbestos abatement contractor is responsible for preparing, and submitting Asbestos Variance Application (ACP-9). If a Variance is required, the Asbestos abatement contractor is responsible to retain a NYSDOL Asbestos Project Designer, as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required variance.

The Asbestos abatement contractor is responsible for preparing and submitting an Asbestos Abatement Permit and/or Work Place Safety Plans (WPSP) that may be required for the completion of the Contract or incidental work. If such plans are required, the Asbestos abatement contractor is responsible to retain a NYSDOL Licensed Design Professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The Asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The Asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The Asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

- I. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work in other than regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.

- J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the Asbestos abatement contractor to pay premium or overtime wages to complete the work. If the Commissioner orders work in other than regular working hours, the Asbestos abatement contractor shall multiply the unit price for that portion of the work requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

- A. Requirements: The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must, submit documentation demonstrating compliance with all listed requirements. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, must demonstrate for the three year period prior to the work, that it has been licensed by the New York State Department of Labor, as an "Asbestos abatement contractor".
 2. The asbestos abatement contractor must, for the three year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
 3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must provide evidence of having successfully performed and completed in a timely fashion at least five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$250,000.00 in each of the three years.
 4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work, brief description of the work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
 5. The asbestos abatement contractor must demonstrate that it has the financial resources, supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule,

taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract.

- B. Insurance Requirements: The asbestos abatement contractor must provide asbestos liability insurance in the following amount: 1 million dollars per occurrence, 2 million dollars aggregate (combined single limit). The City of New York shall be named as an additional insured on such insurance policy.
- C. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof.

1.03 **ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES**

The Asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above..

In the event that the project is not classified as "urgent" the Asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

- A. Name and address of building City or operator;
- B. Project description:
 - 1. Size - square feet, number of linear feet, etc;
 - 2. Age - date of construction and renovations (if known);
 - 3. Use - i.e., office, school, industrial, etc.
 - 4. Scope - repair, demolition, cleaning, etc.
- C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;

- D. Building location/address, including Block and Lot numbers;
- E. Work schedule including the starting and completion dates;
- F. Abatement methods to be employed;
- G. Procedures for removal of asbestos-containing material;
- H. Name, title and authority of governmental representative sponsoring project.

1.04 WORK INCLUDED IN UNIT PRICE

The Asbestos abatement contractor will be paid a basic unit price of **\$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR

- A. "Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.
- B. Air monitoring of Asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).
- C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.

1.06 THIRD PARTY MONITORING AND LABORATORY

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).
- C. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the Asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- D. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.

1.07 PAYMENT REQUEST DOCUMENTATION

- B. The following information shall be included for each payment request:
 - 1. Description of work performed.
 - 2. Linear footage and pipe sizes involved.
 - 3. Square footage for boiler & breaching insulation removed.
 - 4. Square footage of non pipe and boiler areas removed, patched, enclosed, sealed, or painted.
 - 5. Square footage of encapsulation, sealing, patching, and painting involved.
 - 6. Total cost associated with compliance with the assigned task.
 - 7. Architectural, Electrical, HVAC, Plumbing, etc. work incidental to the Asbestos Abatement Work.
 - 8. A certified copy (in form 4312-39) to the Comptroller or Financial Officer of the New York City to the effect that the financial statement is true.
 - 9. A signed copy (in form 6506q-6) of certificate of compliance with non-discriminatory provisions of the Contract.

GENERAL CONTRACTOR WORK ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

10. Attach a copy of valid workmen compensation insurance.
 11. Valid asbestos insurance per occurrence.
 12. General liability insurance when required.
- C. Each payment request shall include a grand total for all work completed that billing period, the landfill waste manifests and a copy of waste transporter permit. The Department of Design and Construction will inspect the work performed, review the cost and approve or disapprove requests for payment.
- D. EXPOSURE LOG: With this final payment, the Asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

1.08 QUANTITY CALCULATIONS

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

PIPE INSULATION SIZE O.D.	PIPE SIZE O.D.	SQUARE FOOTAGE PER LINEAR FOOT
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72
3"	1"	0.79
3-1/4"	1-1/4"	0.85
3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5"	3"	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9"	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	14"	4.71

1.09 METHOD OF PAYMENT

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement

contractor, times the unit price specified below. Credits may apply to certain times, as specified below.

- A. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING PIPE INSULATION:** Actual linear footage, multiplied by the square footage factor listed for the respective pipe size in Section 1.09, multiplied by the unit price in Section 1.05.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

100 X 0.65 = 65 sq.ft. 65 x unit price = Payment

100 X 2.62 = 262 sq.ft. 262 x unit price = Payment

- B. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER INSULATION:** (all types including Silicate Block and including the removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

EXAMPLE: Item B. removal and replacement of 1000 S.F. of boiler insulation (incl. Silicate block)

1000 S.F. X (1.5) X the Unit Price = Payment

- C. **REMOVAL, DISPOSAL AND REPLACEMENT OF TANK INSULATION:** (all types including removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

- D. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER UPTAKE, & BREACHING INSULATION:** (all types including stiffening angles and wire lath) Payment shall be made at 2.0 times the unit price per square foot.

- E. **REMOVAL, DISPOSAL AND REPLACEMENT OF DUCT INSULATION:** Payment shall be made at 1.0 times the unit price per square foot.

- F. **REMOVAL, DISPOSAL AND REPLACEMENT OF SOFT ASBESTOS CONTAINING MATERIAL:** (Including sprayed-on fire proofing and sound proofing) Payment shall be made at 1.0 times the unit price per square foot of surface area. Area of irregular surfaces must be calculated and confirmed with DDC representative.

- G. **ACOUSTIC PLASTER REPAIR AND/OR ENCAPSULATION:** Payment shall be made at 0.5 times the unit price per square foot.

- H. **PATCHING OR REPAIR** of items listed in A through F will be paid at 0.33 times the unit price per square foot.

- I. **REMOVAL, DISPOSAL AND REPLACEMENT OF WATERPROOFING ASBESTOS CONTAINING MATERIAL:** (including friable and non-friable waterproofing material from interior and exterior walls, floors, foundations, penetrations, louvers, vents and openings other than windows, doors and skylights) Payment shall be made at 0.5 times the unit price per square foot.
- J. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING ELECTRICAL WIRING INSULATION:** (including friable and non-friable wiring insulation) Payment shall be made at 0.33 times the unit price per square foot.
- K. **PAINTING:** Payment shall be made at 0.05 times the unit price per square foot.
- L. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING PLASTER:** from ceilings and walls, including any wire lath and disposal as asbestos containing waste. Payment shall be made at 0.80 times the unit price per square foot.
- M. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING FLOOR TILES, CEILING TILES, TRANSITE PANELS:** (including any adhesive, glue, mastic and/or underlayment) and disposal as asbestos containing waste. Payment shall be made at 0.40 times the unit price per square foot. If multiple layers are discovered, each additional layer shall be paid at 0.20 times the unit price per square foot.
- N. **ADDITIONAL CLEAN UP/HOUSEKEEPING OF WORK AREA:** (excluding pre-cleaning of work area required by regulations) HEPA vacuuming and wet cleaning of asbestos contaminated surface. Payment shall be made at 0.20 times the unit price per square foot. When GLOVE BAG is employed to remove ACM, cost of HEPA vacuuming and wet cleaning of floor area up to 3 feet on each side of glove-bag shall be included in unit price and no extra payment will be made.
- O. **REMOVAL, DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL:** including mastic, flashing and sealant compound and provide temporary asbestos-free roof covering consisting of one layer of rolled roofing paper sealed with asphaltic roofing compound. Payment shall be made at 0.8 times the unit price per square foot. Credit at a rate of 0.33 times the unit price will be taken for each square foot of temporary roof covering which the Asbestos abatement contractor is directed not to install.
- P. **PICK-UP AND DISPOSAL OF GROSS DEBRIS:** (excluding any waste generated from abatement under Item A-R) at a rate of \$150 per cubic yard for asbestos contaminated waste and \$75 per cubic yard for non-asbestos contaminated waste. This cost includes all labor and material cost associated with work.

- Q. **REMOVAL OF ASBESTOS-CONTAINING BRICK, BLOCK, MORTAR, CEMENT OR CONCRETE:** along with all surfacing materials including wire lath and/or other supporting structures and disposal as ACM waste. Payment shall be made at a rate of \$25.00 per cubic foot of material removed.
- R. **REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING WINDOW/DOOR CAULKING:** including friable and non-friable caulking, weather-stripping, glazing, sealants or other waterproofing materials applied to windows, doors, skylights, etc. Payment shall be made at the rate of \$400.00 per opening regardless of size or configuration. This cost includes labor, consumable materials, set-up/breakdown, removal and disposal, as required.

Note 1: CREDIT: For items listed in A through F, a credit at a rate of 0.33 times the unit price, times the respective multiplier (for each item) will be taken for each square foot of insulation which the asbestos abatement contractor is not directed to reapply.

Note 2: MINIMUM PAYMENT: The minimum payment per call at any individual job sites or various job sites during the same day will be eight hundred dollars (\$800.00).

Note 3: All payments shall be made as described in paragraph 1.09 herein.

Note 4: WORKING HIGHER THAN 12 FEET ABOVE FLOOR LEVEL OR WORK REQUIRING COMPLEX SCAFFOLDING OR CONSTRUCTION WORK PLATFORMS: Provisions are made in this Contract to compensate the Asbestos abatement contractor for work performed in locations that are difficult to access due to work at elevations that are significantly higher than the normal work level. The unit price for these items will be paid at 1.20 times the unit price described in Paragraphs 1.09, A through R for those portions of the work that are more than twelve (12) feet above the grade for that would be judged as the normal working level.

1.10 **GUARANTEE**

- A. Work performed in compliance with each task shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.
- B. The Commissioner of The Department of Design and Construction will notify the Asbestos abatement contractor in writing regarding defects in work under the guarantee.

1.11 **OCCUPANCY OF SITE NOT EXCLUSIVE**

Attention is specifically drawn to the fact that contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the Asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may

be brought upon any site of the work of this Contract. This paragraph applies to those areas outside the regulated Work Area as defined by Title 15, Chapter I of RCNY.

1.12 SUBMITTALS

A. Pre-Construction Submittals:

1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the Asbestos abatement contractor shall present three copies of the following items:
 - a. Asbestos abatement contractor's scope of work, work plan and schedule.
 - b. Asbestos project notifications, approved variances and plans to Government Agencies.
 - c. Copies of Permits, clearance and licenses if required.
 - d. Schedules: the Asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:
 - (1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.
 - (2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.
 - (3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.
 - e. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number to nearest

hospital) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

- f. Material Safety Data Sheets (MSDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.
- g. Worker Training and Medical Surveillance: The Asbestos abatement contractor shall submit a list of the persons who will be employed by him /her to perform the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- h. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.
 - (1) The Asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of the Asbestos abatement contractor; name, address and phone number of Asbestos abatement contractor and City's third party air monitoring firm; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved for entry into the Work Area.
 - (2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.
- i. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks

involved; and understands the use and limitations of the respiratory equipment to be used.

B. During Construction Submittals:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
3. Floor plans indicating Asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager.
4. All Asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the Asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from Asbestos abatement contractor, Sub-Asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,
4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,
6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
 - a. Fully executed disposal certificates and transportation manifest.

8. Project Record: The Asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:
 - a. Copies of licenses of all asbestos abatement contractors involved in the project;
 - b. Copies of NYCDEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
 - c. Copies of all project notifications and reports filed with NYCDEP, NYSDOL and USEPA for the project, with any amendments or variances;
 - d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
 - e. A copy of the air sampling log and all air sampling results;
 - f. A copy of the abatement asbestos abatement contractor's daily log book;
 - g. Copies of all asbestos waste manifests;
 - h. A copy of all Project Monitor's Reports (ACP-15).
 - i. A copy of each ATR-1 Form completed for the asbestos project (if required).
 - j. A copy of each Asbestos Project Conditional Closeout Report (ACP-20) if required.
 - k. A copy of the Asbestos Project Completion Form (ACP-21).

1.13 PROTECTION OF FURNITURE AND EQUIPMENT

Cover all furniture and equipment that cannot be removed from Work Areas. Movable furniture and equipment will be removed from Work Areas by the Asbestos abatement contractor prior to start of work. At the conclusion of the work (after final air testing), the Asbestos abatement contractor will remove all plastic covering on walls, floors, furniture, equipment and reinstall furniture and equipment. He shall remove and store all sheaths, curtains and drapes, and reinstall same following final clean up.

1.14 UTILITIES

A. General:

All temporary facilities shall be subject to the approval of the Commissioner. Prior to starting work at any site, locations and/or sketches (if required) of temporary facilities must be submitted to the Construction Project Manager for the required approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the Asbestos abatement contractor in buildings under their jurisdiction. However, it is the responsibility of the Asbestos abatement contractor to ensure that hot water is provided for showering in the decontamination unit. The Asbestos abatement contractor shall furnish, install and maintain any needed equipment to meet these requirements at his own expense.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the Asbestos abatement contractor in a building, under their jurisdiction. The Asbestos abatement contractor is responsible for routing the electric power to the abatement Work Area.

All temporary lighting and temporary electrical service for Work Area shall be in weatherproof enclosures and be ground fault protected.

- D. In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the Asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

1.15 FEES

The Asbestos abatement contractor shall be responsible for any and all fees or charges imposed by Local, State or Federal Law, Rule and Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

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SECTION 028213

ASBESTOS ABATEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Contract Documents are as defined in the “Agreement”. The General Conditions shall apply to all Work of this Section.
- B. Work specified herein shall be the removal and disposal of Asbestos-Containing Materials (ACM) and asbestos-contaminated materials from designated areas of the New EMS Station 50, 159-10 Goethals Avenue, Jamaica, New York, 11432.
- C. The following documents were reviewed and utilized to generate this abatement design specification which serves to locate and quantify the amount of ACM, and asbestos contaminated material, to be abated in support of this project.
 - 1. Set of a drawing titled “Topographical Map”, dated 08/02/2005, prepared by NYC DDC Bureau of Site Engineering Topographical Section;
 - 2. Asbestos Survey Report performed by LiRo Engineers, Inc. dated 08/31/2006.
 - 3. Asbestos Design Specifications/and Report performed by LiRo Engineers, Inc. dated 07/05/2007.
- D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

1.02 SCOPE OF WORK

- A. The asbestos abatement contractor is to provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement of ACM as required by these contract documents. All work shall be performed in accordance with this Specification, EPA regulations, OSHA regulations, New York City Local Law 70, Title 15, Chapter 1 RCNY, New York State Industrial Code 56, NIOSH recommendations, and any other applicable federal, state or local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. The intent of this Specification section is to ensure that the asbestos abatement contractor is responsible for the following:
 - 1. Abatement of all ACM.

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2. Cleaning and decontamination of the entire affected area.
 3. Demolition that may be required to access ACM in each area, Asbestos abatement contractor shall dispose of all debris associated with demolition activities as ACM waste.
 4. Removal and disposal of all ACM found within these areas such as duct vibration cloth, roof membrane, roof flashing material, etc.
 5. Provide all scaffolding, platform installation, equipment, tools, transportation and any other equipment required and/or necessary to complete all work described in the Contract Documents.
 6. The Asbestos abatement contractor shall be responsible for and shall include any and all fees or changes imposed by Local, State or Federal Law, Rule or Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the work.
 7. Prior to destructive demolition activities, the DDC may elect to collect bulk samples of assumed asbestos-containing materials and analyze the bulk samples for asbestos content.
- C. The Asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work.

1. Drawing H-002: Underground Utility Tunnel Plan

- a. Remove and dispose of asbestos-containing pipe and pipe fittings insulation within **Work Area 1**. Work Area 1 shall be removed utilizing NYC DEP Title 15, Chapter 1, Full Containment Procedures with any applicable NYC DEP Title 15 Site Specific Variances.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1	NYC DEP Title 15, Chapter 1, Full Containment Procedures with any applicable NYC DEP Title 15 Site Specific Variances	--	870 Ln. Ft. Pipe and Pipe Fittings Insulation (3", 4", 6", and 10" outside diameter) 6 Pipes Total

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- D. The facility is under the jurisdiction of the NYC HHC and FDNY. The asbestos abatement contractor shall perform the work of this contract in a manner that will be least disruptive to the normal use of the building.
- E. Asbestos abatement contractor's attention is directed to the fact that patents cover certain methods of asbestos abatement indicated in the specifications. To date, patents have been issued with regard to negative pressure enclosures or negative or reduced pressure and glove-bag.
- F. Asbestos abatement contractor shall be solely responsible for and shall hold the City of New York Department of Design and Construction and the City harmless from, any and all damages, losses and expenses resulting from any infringement by Asbestos abatement contractor of any patent, including but not limited to the patents described above, used by Asbestos abatement contractor during performance of this agreement.
- G. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the City of New York Department of Design and Construction if he anticipates any difficulty in performing the work as directed and required by these Specifications. Asbestos abatement contractor shall be required to attend an on-site job meeting with the Construction Project Manager prior to start of work to examine conditions of the site for removal and plan the sequence for removal operations.
- H. The asbestos abatement contractor shall retain a certified Project Designer for the preparation of an Asbestos Variance Application (ACP-9), if required.
- I. The asbestos abatement contractor shall be responsible for preparing and submitting all filings, notifications, amendments and variances, etc. required by all City, State and Federal regulatory agencies having jurisdiction, at no additional cost to the NYC DDC.
- J. The asbestos abatement contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to prepare a Work Place Safety Plan (WPSP), if required.
- K. The asbestos abatement contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to perform final inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required under Chapter 17 of the Building Code. Such special inspections and A-TR1 forms shall be completed by the Registered Design professional.
- L. For coordination with other Asbestos abatement contractors, see the General Conditions governing all Contracts.

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M. Related Asbestos Removal Work Under Other Contracts:

1. Each asbestos abatement contractor shall be responsible for the removal of incidental asbestos not identified in this section and found prior to or during the Work.
2. Incidental asbestos is defined as ACM that is discovered during the course of their work that must be abated to enable them to perform the work of their Contract.

N. Work Hours:

1. The asbestos abatement contractor shall establish his work schedule in a way that avoids interference or conflict with the normal functioning of the facility. Work in the evenings shall be done at no additional cost to the City.
2. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work other than regular working hours and such authorization is granted by the Commissioner (Regular working hours are those during which any given facility in which work is to be done is customarily open and functioning). If such work schedule is authorized by the Commissioner the work shall be done at no additional cost to the City.
3. The order of phases and start dates associated with each will be determined by the Construction Project Manager.
4. Asbestos abatement contractor shall be required to schedule waste transfer during evening hours, when activity within the facility is at a minimum. Evening hours are defined as 6:00 p.m. to 6:00 a.m. Waste transfer must be approved by the Construction Project Manager and Facility Manager.

O. The following conditions shall apply to all temporary shutdowns of existing services:

1. All temporary lighting and temporary electrical services for use in the Work Area shall be in weather proof enclosures and be ground fault protected and:
2. Shall be performed at no additional charge to the City.
3. Shall be performed at times not interfering with the other activities in the building.
4. Shall be performed only with written consent from the Commissioner and the Facility Manager.

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5. Shall be made through written request to the Commissioner at least 10 days in advance with complete written description of the work to be performed.

P. Stages of Asbestos Removal Work:

- a. The asbestos abatement contractor will be required to perform the work and it is the intent of this Specification to remove all asbestos containing and asbestos contaminated materials from the Work Area. The asbestos abatement contractor is responsible for verifying all quantities of materials listed.

- Q. Certain equipment in the Work Area may need to remain operational during removal. Therefore, the removal of ACM from this equipment shall be performed as the last removal activities within the Work Area. The Asbestos abatement contractor shall coordinate the scheduling for the removal of ACM on functioning equipment with the Construction Project Manager.

1.03 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

- A. Requirements: The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must submit documentation demonstrating compliance with all listed requirements. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work, that it has been licensed by the New York State Department of Labor, as an "Asbestos Abatement Contractor".
 2. The asbestos abatement contractor must, for the three year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
 3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must provide evidence of having successfully performed and completed in a timely fashion at least five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$1,000,000 in each of the three years.
 4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of

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the work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.

5. The asbestos abatement contractor must demonstrate that it has the financial resources, supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract.
- B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.
- C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to:
 1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.
 2. Handling, storage, transportation and disposal of the material.
 3. Availability of qualified and skilled labor.
 4. Availability of utilities.
 5. Exact quantities of all materials to be disturbed and/or removed.

1.04 WORK BY OTHERS

The City reserves the right during the term of this Contract to have work performed on asbestos abatement projects by other asbestos abatement contractors as the situation warrants.

1.05 DEFINITIONS

- A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.

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B. Definitions in General Use:

1. Approve: Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Asbestos abatement contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in Contract Documents. In no case will "approval" by Engineer be interpreted as a release of Asbestos abatement contractor from responsibilities to fulfill requirements of Contract Documents.
2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Asbestos abatement contractor's responsibility for construction supervision.
3. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
4. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
5. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
6. Installer: The term "installer" is defined as the entity (person or firm) engaged by the asbestos abatement contractor, or its sub-asbestos abatement contractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.
7. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

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8. Third-Party Air Monitor: The term "Third-Party Air Monitor " is defined as an entity engaged by City and Construction Project Manager to perform specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

C. Definitions Relative to Asbestos Abatement:

1. Abatement: Any and all procedures physically taken to control fiber release from asbestos-containing materials. This includes removal, encapsulation, enclosure, cleanup and repair.
2. Adequately Wet: The complete penetration of a material with amended water to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet. ACM must be fully penetrated with the wetting agent in order to be considered adequately wet. If the ACM being abated is resistant to amended water penetration, wetting agent shall be applied to the material prior to and during removal as necessary to minimize fiber release.
3. Aggressive Sampling: Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.
4. AHERA: Asbestos Hazard Emergency Response Act of 1986
5. AIHA: American Industrial Hygiene Association.
6. Airlock: System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.
7. Air Sampling: Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.
8. Ambient Air Monitoring: "Ambient air monitoring" shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the worksite.

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9. Amended Water: Water to which a surfactant has been added.
10. ANSI: American National Standards Institute
11. Area Air Sampling: Any form of air sampling or monitoring where the sampling device is placed at some stationary location.
12. Asbestos: Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.
13. Asbestos-Containing Material (ACM): Asbestos or any material containing more than one-percent asbestos.
14. Asbestos-Containing Waste Material: ACM, asbestos-contaminated objects or debris associated with asbestos abatement requiring disposal.
15. Asbestos-Contaminated Objects: Any objects which have been contaminated by asbestos or asbestos-containing material.
16. Asbestos Assessment Report: "Asbestos Assessment Report" shall mean the "Form ACP-5" form, as approved by NYCDEP, by which a NYCDEP-certified asbestos investigator certifies that a building or structure (or portion thereof) is free of ACM or the amount of ACM to be abated constitutes a minor project.
17. Asbestos Handler: Individual who disturbs, removes, repairs, or encloses asbestos material. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
18. Asbestos Handler Supervisor: Individual who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
19. Asbestos Investigator: An individual certified by NYCDEP as having successfully demonstrated his or her ability to identify the presence of and evaluate the condition of asbestos in a building or structure.
20. Asbestos Project: Any form of work performed in a building or structure which will disturb (e.g., remove, enclose, encapsulate) more than 25 linear feet or more than 10 square feet of asbestos-containing material.

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21. ASTM: American Society for Testing and Materials.
22. Asbestos Project Notification: The "Form ACP-7" asbestos project notification form as approved by DEP.
23. Authorized Visitor: Authorized visitor shall mean the building owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.
24. Building Owner: Person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building Owner means the person in whom beneficial title is vested.
25. Building Materials: Any and all manmade materials, including but not limited to interior and exterior finishes, equipment, bricks, mortar, concrete, plaster, roofing, flooring, caulking, sealants, tiles, insulation, and outdoor paving such as sidewalks, paving tiles and asphalt.
26. Certified Industrial Hygienist (CIH): Individual with a minimum of five years experience as an industrial hygienist and who has successfully completed both levels of the examination administered by the American Board of Industrial Hygiene and who is currently certified by that board.
27. Certified Safety Professional (CSP): Individual having a bachelor's degree from an accredited college or university and a minimum of four years experience as a safety professional and who has successfully completed both levels of the examination administered by the Board of Certified Safety Professionals and who is currently certified by that board.
28. Chain of Custody: "Chain of Custody" shall mean the form or set of forms that document the collection and transfer of a sample.
29. City: City of New York
30. Clean Room: An uncontaminated area or room that is part of worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.
31. Clearance Air Monitoring: Employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers and shall be performed as the final abatement activity.
32. Commissioner: shall mean the head of the Agency that has entered into this contract or his/her duly authorized representative.
33. Competent Person: Shall mean the designated person as defined by OSHA in 29 CFR1926.1101.

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34. **Curtained Doorway:** Device that consists of at least three overlapping sheets of fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.
35. **Decontamination Enclosure System:** Series of connected rooms, separated from the Work Area and from each other by air locks, for the decontamination of workers, materials, waste containers, and equipment.
36. **Demolition:** The dismantling or razing of a building, including all operations incidental thereto (except for asbestos abatement activities), for which a demolition permit from the New York City Department of Buildings is required.
37. **NYCDEP or DEP:** The New York City Department of Environmental Protection.
38. **Disturb:** Any action taken which may alter, change, or stir, such as but not limited to the removal, encapsulation, enclosure or repair of asbestos-containing material.
39. **DOB:** The New York City Department of Buildings.
40. **Egress:** A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.
41. **ELAP:** Environmental Laboratory Approval Program administered by the New York State Department of Health.
42. **Encapsulant (sealant) or Encapsulating Agent:** Liquid material which can be applied to ACM and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
43. **Encapsulation:** The coating or spraying of asbestos-containing material encapsulant. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or

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abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

44. Enclosure: Construction of airtight walls and/or ceilings between ACM and the facility environment, or around surfaces coated with ACM, or any other appropriate procedure as determined by the NYCDEP which prevents the release of asbestos fibers.
45. EPA or USEPA: United States Environmental Protection Agency.
46. Equipment Room: Contaminated area or room that is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.
47. Exit: That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction to provide a protected path of egress travel between the exit access and the exit discharge.
48. FDNY: The Fire Department of the City of New York; HHC : The Health and Hospitals Corporation
49. Fiber: An acicular single crystal or a similarity elongated polycrystalline aggregate which displays some resemblance to organic fibers by having such properties as flexibility, high aspect ratio, silky luster, axial lineation, and others, and which has attained its shape primarily through growth rather than cleavage.
50. Fixed Object: A unit of equipment, furniture, or other item in the work area which cannot be removed from the work area. Fixed objects shall include equipment, furniture, or other items that are attached, in whole or in part, to a floor, ceiling, wall, or other building structure or system or to another fixed object and cannot be reasonably removed from the work area. Fixed objects shall also include pipes and other equipment inside the work area which are not the subject of the asbestos project. Active fire suppression system components shall not be considered fixed objects.
51. Glovebag technique: shall mean a method for removing asbestos-containing material from heating, ventilation and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces. The glovebag assembly is a manufactured device consisting of a large bag (constructed of at least 6-mil transparent plastic), two inward-projecting long sleeve gloves, one inward-projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or

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area to be decontaminated and contains all asbestos fibers released during the removal process.

52. HEPA-Filter: High efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers mass median aerodynamic equivalent diameter.
53. HEPA vacuum equipment: "HEPA vacuum equipment" shall mean vacuuming equipment with a HEPA filter.
54. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.
55. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.
56. Industrial Hygiene: Science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among worker or among the citizens of the community.
57. Industrial Hygienist: Individual having a college or university degree or degrees in Engineering, Chemistry, Physics or Medicine, or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:
 - a. To recognize the environmental factors and to understand their effect on people and their well being; and
 - b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair people's health and well being; and
 - c. To prescribe methods to eliminate, control, or reduce such stresses when necessary to alleviate their efforts.
58. Isolation Barrier: The construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the work place from surrounding areas and to contain asbestos fibers in the work area.
59. Large Asbestos Project: Asbestos project involving the disturbances (e.g., removal, enclosure, encapsulation) of 260 linear feet or more of ACM or 160 square feet or more of ACM.

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60. Log: An official record of all activities that occurred during the project. At a minimum, the log shall identify the building owner, agent, asbestos abatement contractor, and workers, and other pertinent information including daily activities, cleanings and waste transfers, names and certificate numbers of asbestos handler supervisors and asbestos handlers; results of inspections of decontamination systems, barriers, and negative pressure ventilation equipment; summary of corrective actions and repairs; work stoppages with reason for stoppage; manometer readings at least twice per work shift; daily checks of emergency and fire exits and any unusual events.
61. Minor Project: A project involving the disturbance (e.g., removal, enclosure, encapsulation, repair) of 25 linear feet or less of asbestos containing material or 10 square feet or less of asbestos containing material.
62. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.
63. Negative Air Pressure Equipment: Portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside and inside of the Work Area.
64. NESHAPS: National Emission Standards for Hazardous Air Pollutants.
65. NFPA: The National Fire Protection Association.
66. NIOSH: National Institute for Occupational Safety and Health.
67. DEP or NYCDEP: New York City Department of Environmental Protection
68. NYSDOL: New York State Department of Labor.
69. NYSDOL ICR 56: "NYSDOL ICR 56" shall mean Part 56 of the Official Compilation of Codes, Rules and Regulations of the State of New York or 12 NYCRR Part 56.
70. NYSDOH: The New York State Department of Health.
71. Obstruction: The blocking of a means of egress with any temporary structure or barrier. A double layer of fire-retardant 6-mil polyethylene sheeting shall not be considered an obstruction when it is prominently marked as an exit with photo luminescent signage or paint and cutting tools (knife, razor) are attached to the work area side of the sheeting for use in the event that the sheeting must be cut to permit egress. A corridor shall not be considered obstructed when there is a clear path measuring at least three (3) feet wide.

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- 72. Occupied Area: Area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.
- 73. OSHA: Occupational Safety and Health Administration.
- 74. Outside air: "Outside air" shall mean the air outside the work place.
- 75. Person: Individual, partnership, company, corporation, association, firm, organization, governmental agency, administration, or department, or any other group of individuals, or any officer or employee thereof.
- 76. Personal Air Monitoring: Method used to determine employees' exposure to airborne asbestos fibers. The sample is collected outside the respirator in the worker's breathing zone.
- 77. Personal Protective Equipment (PPE): Appropriate protective clothing, gloves, eye protection, footwear, and head gear.
- 78. Phase Contrast Microscopy (PCM): The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400).
- 79. Physician: Person licensed or otherwise authorized under Article 131 Section 65.22 of the New York State Education Law.
- 80. Plasticize: To cover floors and walls with fire retardant plastic sheeting as herein specified or by using spray plastics as acceptable to the Department.
- 81. Polarized Light Microscopy (PLM): The measurement protocol for the assessment of the asbestos content of bulk materials. (Interim Method for the Determination of Asbestiform Materials in Bulk Insulation Samples- 40 CFR Part 763, Subpart F, Appendix A as amended on September 1, 1982)
- 82. Project Designer: A person who holds a valid Project Designer Certificate issued by the New York State Department of Labor.
- 83. Project Monitor: A person who holds a valid Project Monitor Certificate issued by the New York State Department of Labor.
- 84. Qualitative Fit Test: Individual test subject's responding (either voluntarily or involuntarily) to a chemical challenge outside the respirator face-piece. Acceptable methods include irritant smoke test, odorous vapor test, and taste test.
- 85. Quantitative Fit Test: Exposing the respiratory wearer to a test atmosphere containing an easily detectable, nontoxic aerosol, vapor or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside

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the face-piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents, and exercises to perform during the test.

86. Registered Design Professional: A person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York.
87. Removal: Stripping of any asbestos- containing materials from surfaces or components of a facility or taking out structural components in accordance with 40 CFR 61 Subparts A and M.
88. Renovation: An addition or alteration or change or modification of a building or the service equipment thereof, that is not classified as an ordinary repair as defined in §27-125 of the Administrative Code of the City of New York.
89. Repair: Corrective action using specified work practices (e.g., glovebag, plastic tent procedures, etc.) to minimize the likelihood of fiber release from minimally damaged areas of ACM.
90. Replacement material: Any material used to replace ACM that contains less than .01 percent asbestos.
91. Shift: A worker's, or simultaneous group of workers', complete daily term of work.
92. Shower Room: Room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.
93. Small Asbestos Project: Asbestos project involving the disturbance (e.g., removal, enclosure, encapsulation) of more than 25 and less than 260 linear feet of ACM or more than ten and less than 160 square feet of ACM.
94. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.
95. Strip: To remove asbestos materials from any part of the facility.
96. Structural Member: Load-supporting member of a facility, such as beams and load-supporting walls, or any non-load-supporting member, such as ceiling and non-load-supporting walls.

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97. Surface barriers: The plasticizing of walls, floors, and fixed objects within the work area to prevent contamination from subsequent work.
98. Surfactant: Chemical wetting agent added to water to improve penetration.
99. Transmission Electron Microscopy (TEM): The measurement protocol for the assessment of the asbestos fiber content of air. Interim Transmission Electron Microscopy Analytical Methods-40 CFR Part 763, Subpart E, Appendix A.
100. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.
101. Washroom: Room between the Work Area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA-vacuumed prior to disposal.
102. Waste decontamination enclosure system: "Waste decontamination enclosure system" shall mean the decontamination enclosure system designated for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.
103. Wet Cleaning: "Wet cleaning" shall mean the removal of asbestos fibers from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water.
104. Wet methods: "Wet methods" shall mean the use of amended water or removal encapsulants to minimize the generation of fibers during ACM disturbance.
105. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.
106. Worker Decontamination Enclosure System: Portion of a decontamination enclosure system designed for controlled passage of workers and authorized visitors, consisting of a clean room, a shower room, and an equipment room separated from each other and from the Work Area by airlocks and curtained doorways.
107. Work Place: The work area and the decontamination enclosure system(s).
108. Work Place Safety Plan: Construction documents prepared by a registered design professional and submitted for review by DEP in order to obtain an asbestos abatement permit. Such plan shall include, but not be limited to, plans, sections, and details of the work area clearly showing the extent, sequence, and means and methods by which the work is to be performed.

109. Work Site: Premises where abatement activity is being performed. May be composed of one or more Work Areas.

1.06 STANDARD OPERATING PROCEDURES

- A. Develop and implement a written standard procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, employees, public, and environment.

B. TELEPHONE PAGING DEVICE

The asbestos abatement contractor or his authorized representative shall, at all times during the normal workday or during periods of overtime work under this Contract, carry a digital telephone paging device ("Beeper") and/or cellular telephones which can be activated by a telephone number in the 212 or 646 or 718 or 917 or 929 area code. He shall supply the Department of Design and Construction with the activation number for the device and he is liable to respond back to the calls from DDC within the next one (1) hour period after he receives calls from DDC. The cost to the asbestos abatement contractor for this device and all charges accruing thereto is deemed included in the work..

- C. The standard operating procedure shall ensure:

1. Tight security from unauthorized entry into the workspace.
2. Restriction of asbestos abatement contractor's personnel to the immediate Work Area and access/egress routes.
3. Donning of proper protective clothing and respiratory protection prior to entering the Work Area.
4. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking the respiratory protection.
5. Proper exit practices from the work space to the outside through the showering and decontamination facilities.
6. Removing asbestos in a way that minimizes release of fibers.
7. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimizes exposure and contamination.
8. Emergency evacuation procedures, for medical or safety situations, to minimize the potential exposure to airborne asbestos fibers for emergency personnel, building occupants, and building environment.

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9. Safety from accidents in the workspace, especially from electrical shocks, fall hazards associated with scaffolding, slippery surfaces, and entanglements in loose hoses and equipment.
 10. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.
 11. Engineering controls that minimize exposure to fibers within the workspace.
 12. The asbestos abatement contractor shall provide a 24-hour fire watch throughout the entire term of the project, to protect against fire and unauthorized entry into the workspace. Fire watch shall be performed by an individual who is a certified asbestos worker capable of entering the Work Area for regular inspections.
- D. Provide an Asbestos Handler Supervisor to provide continuous supervision of all work, and to be responsible for the following:
1. Ensure that individuals are using proper personal protective equipment, are trained in its use and hold valid NYCDEP and NYSDOL Asbestos Handler certificates
 2. Maintain entry log records and ensure that they are recorded in accordance with the provisions of Title 15, Chapter 1 of RCNY and NYSDOL ICR 56.
 3. Surveillance of the Work Areas at a minimum of once per work shift or as required by Title 15, Chapter 1 of RCNY and NYSDOL ICR 56 -7.3, to ensure the integrity of work place isolation, negative pressure equipment and workers personal protective equipment is not torn or ripped and that respiratory protection is worn at all times.
 4. Ensure that sufficient personal protective equipment is stored in the clean room.
 5. Take precautions to prevent heat stress. Precautions include, but are not limited to, selecting lightweight protective clothing, reducing the work rate, and providing adequate fluid breaks.
 6. Perform work area inspection with project monitor prior to the commencement of final clearance air monitoring.
 7. The asbestos abatement contractor shall retain the asbestos handler supervisor to perform a visual inspection prior to the post-abatement clearance air monitoring to confirm that all containerized waste has been removed from work and holding areas and there is no visible ACM debris or residue on or about all abated surfaces.

E. ENGINEERING CONTROLS

1. The 8-hour time weighted average airborne concentration of fibers to which any passerby may be exposed shall not exceed 0.01 fibers per cubic centimeter of air when fibers have a physical dimension longer than 5 micrometers as determined by the method prescribed in these Specifications.
2. All asbestos projects shall utilize negative pressure ventilation equipment.
 - a. The asbestos abatement contractor shall use a manometer to document the pressure differential. The asbestos abatement contractor shall install and make the manometer operational once the negative pressure has been established in the work area. Magnahelic manometers shall be calibrated at least every six months and a copy of the current calibration certification shall be available at the work site.
3. Negative pressure ventilation equipment shall be installed and operated to provide at least one air change in the work area every 15 minutes. Where there are no floor or wall barriers because floor or wall material is being abated, there shall be at least one air change in the work area every ten minutes.
4. The negative pressure ventilation equipment shall operate continuously, 24 hours a day, from the establishment of isolation barriers through successful clearance air monitoring. If such equipment shuts off, adjacent areas shall be monitored for asbestos fibers.
5. A static negative air pressure of 0.02 inches (minimum) water column shall be maintained at all times in the work place during abatement to ensure that contaminated air in the Work Area does not filter back to uncontaminated areas.
6. If the contaminated area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors, the cut off switch shall be able to turn off the equipment on all floors.
7. On loss of negative pressure or electric power to the negative pressure ventilating units, abatement shall stop immediately and shall not resume until power is restored and negative pressure ventilation equipment is operating again.

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8. Negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas.
 - a. All openings (including but not limited to operable windows, doors, vents, air intakes or exhausts of any mechanical devices) less than 15 feet from the exterior exhaust duct termination location shall be plasticized with two layers of fire retardant 6-mil polyethylene sheeting, or a second negative pressure ventilation unit with the primary unit's capacity shall be connected in series prior to exhausting to the outside.
 - b. Negative pressure ventilation equipment shall exhaust away from areas accessible to the public.
 - c. All ducting shall be sealed and braced or supported to maintain airtight joints. Ducts shall be reinforced and shall be installed so as to prevent breakage. Damage to ducts must be repaired immediately.
9. Where ducting to the outside is not possible, a second negative pressure ventilation unit compatible with the primary unit's capacity shall be connected in series. The area receiving the exhaust shall have sufficient, non-recycling exhaust capacity to the outside of the structure.
10. In the event that there is a failure of the containment system or a breach in the Isolation Barriers, all abatement work will cease and the asbestos abatement contractor will immediately correct the condition. Abatement work will not resume until the Work Area has been smoke tested by the third party laboratory and approved by the Construction Project Manager.

F. LOCKDOWN ENCAPSULATION PROCEDURES

1. The following procedures shall be followed to seal in non-visible residue while conducting lockdown encapsulation on all surfaces from which ACM has not been removed:
 - a. Only encapsulants rated as acceptable or marginally acceptable on the basis of Battelle Columbus Laboratory test procedures and rating requirements developed under the 1978 USEPA Contract shall be used for lockdown encapsulation.
 - b. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon unless reviewed and approved by DEP.
 - c. Latex paint with solids content greater than 15 percent shall be considered a lockdown sealant for coating all non-metallic surfaces.

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- d. Encapsulants shall be applied using airless spray equipment. Spraying is to occur at the lowest pressure range possible to minimize fiber release from encapsulant impact at the surface. It shall be applied with a consistent horizontal or vertical motion.
- e. The cleaned layer of the surface barriers shall be removed from walls and floors.
- f. The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

1.07 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS, AND POSTERS

- A. The asbestos abatement contractor shall submit an Asbestos Project Notification (ACP-7) to the NYCDEP listing each work area within the building separately one week in advance of the start of work.
- B. The asbestos abatement contractor shall obtain an asbestos abatement permit authorizing the performance of construction work as required for asbestos projects involving one or more of the following activities:
 - 1. Obstruction of an exit door leading to an exit stair or the exterior of the building;
 - 2. Obstruction of an exterior fire escape or access to that fire escape;
 - 3. Obstruction of a fire-rated corridor leading to an exit door;
 - 4. Removal of handrails in an exit stair or ramp;
 - 5. Removal or dismantling of any fire alarm system component including any fire alarm-initiating device (e.g., smoke detectors, manual pull station);
 - 6. Removal or dismantling of any exit sign or any component of the exit lighting system, including photo luminescent exit path markings;
 - 7. Removal or dismantling of any part of a sprinkler system including piping or sprinkler heads;
 - 8. Removal or dismantling of any part of a standpipe system including fire pumps or valves;

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9. Removal of any non-load bearing / non-fire-rated wall (greater than 45 square feet or 50 percent of a given wall);
 10. Any plumbing work other than the repair or replacement of plumbing fixtures;
 11. Removal of any fire-resistance rated portions of a wall, ceiling, floor, door, corridor, partition, or structural element enclosure including spray-on fire resistance rated materials;
 12. Removal of any fire damper, smoke damper, fire stopping material, fire blocking, or draft stopping within fire-resistance rated assemblies or within concealed spaces;
 13. Any work that otherwise requires a permit from the DOB (full demolitions, alterations, renovations, modifications or plumbing work).
- C. The asbestos abatement contractor shall provide a floor plan showing the areas of the building under abatement and the location of all fire exits in said areas. It shall be prominently posted in the building lobby or comparable location, along with a notice stating the location within the building of the negative air cutoff switch, if applicable.
- D. The asbestos abatement contractor shall submit, as required, an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (1-8) and (B) (13) of this specification. The asbestos abatement contractor is responsible for submitting, with an asbestos project notification, a work place safety plan (WPSP) and any other applicable construction documents. These documents must be prepared by a registered design professional.
- E. A WPSP is not required for projects requiring an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (9-12) of this specification. The asbestos abatement contractor shall submit, together with the asbestos project notification, all applicable asbestos abatement permit construction documents.
- F. The asbestos abatement contractor shall retain a Registered Design Professional to perform the inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required by Chapter 17 of the Building Code, as follows:
1. A final inspection shall be performed by a registered design professional retained by the asbestos abatement contractor after all work authorized by the asbestos abatement permit is completed. The person performing the inspection shall note all failures to comply with the provisions of the Building Code or approved asbestos abatement permit and shall promptly notify the owner in writing. All defects noted in such inspection shall be corrected. The final inspection report shall either:

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a. Confirm:

- (1) That the construction work is complete, including the reinstallation or reactivation of any building fire safety or life safety component.
- (2) That any defects previously noted have been corrected.
- (3) That all required inspections were performed.
- (4) That the work is in substantial compliance with the approved asbestos abatement permit construction documents, the Building Code, and other applicable laws and rules.

b. Confirm:

- (1) That the construction work does not return the building (or portion thereof) affected by the abatement project to a condition compliant with the building code and other applicable laws and rules, but that the registered design professional has reviewed an application for asbestos abatement permit construction documents approval that has been approved by the department of buildings, and the subsequent scope of work as approved will, upon completion, render all areas affected by the asbestos project in full compliance with the building code and all applicable laws and rules.
- (2) That any defects previously noted that are not addressed by the subsequent scope of work as approved by the department of buildings, have been corrected.
- (3) That all required inspections that are not addressed by the subsequent scope of work as approved by the department of buildings were performed.
- (4) That all completed work pursuant to an asbestos abatement permit is in substantial compliance with the approved asbestos abatement permit construction documents.

G. The asbestos abatement contractor shall provide the final inspection reports to be filed with DEP on A-TR1 form. Records of final inspections made by registered design professionals shall be submitted to DDC as part of the close out document package.

H. Erect bilingual (English-Spanish) warning signs around the work space and at every point of potential entry from the outside and at main entrance to building

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which can be viewed by the public without obstruction, in accordance with OSHA 29 CFR 1926.1101 (K) (Sign Specifications) and Title 15, Chapter 1 of RCNY. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements.

- I. Provide the required labels for all polyethylene bags and all drums utilized to transport contaminated material to the landfill in accordance with OSHA 29 CFR 1926.1101 (K)(2) and by 49 CFR Parts 171 and 172 of the Department of Transportation regulations.
- J. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, NIOSH, State of New York and New York City and any additional items mandated for posting by the aforementioned regulations.
- K. Furnish all permits, variances and notices required to perform the Work.

1.08 EMERGENCY PRECAUTIONS

- A. Establish emergency and fire exits from the Work Area. The clean side of all emergency exits shall be equipped with two full sets of protective clothing and respirators at all times.
- B. Notify local medical emergency personnel, both ambulance crews and hospital emergency room staff prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workmen, and shall be advised on safe decontamination.
- C. Prepare to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated immediately for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e., misting of the air with water) until the injured person has been removed from the Work Area.
- D. Notify, before actual removal of the asbestos material, the local police and fire departments to the danger of entering the Work Area. Asbestos abatement contractor shall make every effort to help these agencies form plans of action should their personnel need to enter the contaminated area.

1.09 SUBMITTALS

- A. Pre-Construction Submittals:

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1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items, bound and indexed. The detailed plan of action must be submitted at least five (5) days prior to the pre-construction meeting.
 - a. Asbestos abatement contractor's scope of work, work plan and schedule.
 - b. Asbestos project notifications, approved variances and plans to Government Agencies.
 - c. Copies of Permits, clearance and licenses if required.
 - d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:
 - (1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.
 - (2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.
 - (3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.
 - (4) A schedule of equipment to be used including numbers and types of all major equipment such as HEPA Air Filtration Units, HEPA-vacuums, airless sprayers, Water Atomizing Devices and Type "C" compressors.
 - e. A written plan and shop drawings for preparation of work site and decontamination chamber.
 - f. Description of protective clothing and approved respirator to be used, make, model, NIOSH approval numbers.

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- g. Delineation of responsibility of work site supervision, including competent person, with names, resumes, and home telephone numbers.
- h. Explanation of decontamination sequence and isolation techniques.
- i. Description of specific equipment to be utilized, including make and model number of air filtration devices, vacuums, sprayers, etc.
- j. Description of any prepared methods, procedures, techniques, or equipment other than those specified in the Contract Documents.
- k. Explanation of the handling of asbestos contaminated wastes including EPA and NYCDEP identification numbers of Waste Hauler.
- l. Description of the final clean-up procedures to be used.
- m. Name and qualifications of asbestos abatement contractor's Air Monitor including AIHA accreditation, and proof of NIOSH PAT and NIST/NVLAP Bulk Quality Assurance Proficiency of OSHA samples for approval by the City of New York Department of Design and Construction.
- n. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.
- o. Material Safety Data Sheets (MSDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.
- p. Worker Training and Medical Surveillance: Asbestos abatement contractor shall submit a list of the persons who will be employed by him in the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- q. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

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- (1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of Environmental Control Representative; name, address and phone number of asbestos abatement contractor; name, address and phone number of asbestos abatement contractor and City's air testing entity; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved by the laboratory for entry into the Work Area.
 - (2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit a copy of the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.
- r. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.
- B. Submit copies of the following items to the Construction Project Manager during the work:
1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
 2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
 3. Floor plans indicating asbestos abatement asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager at weekly progress meetings.
 4. All asbestos abatement contractors' air monitoring and inspection results.

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C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, Sub-asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,
4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,
6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
 - a. Fully executed disposal certificates and transportation manifest.
8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:
 - a. Copies of licenses of all asbestos abatement contractors involved in the project;
 - b. Copies of DEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
 - c. Copies of all project notifications and reports filed with DEP and NYSDOL for the project, with any amendments or variances;
 - d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
 - e. A copy of the air sampling log and all air sampling results;

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- f. A copy of the abatement asbestos abatement contractor's daily log book;
 - g. All data related to bulk sampling including the results of any asbestos surveys performed by an asbestos investigator;
 - h. Copies of all asbestos waste manifests;
 - i. A copy of all Project Monitor's Reports (ACP-15).
 - j. A copy of each ATR-1 Form completed for the asbestos project (if required).
 - k. A copy of each Asbestos Project Conditional Closeout Report (ACP-20).
 - l. A copy of the Asbestos Project Completion Form (ACP-21).
9. The asbestos abatement contractor shall submit one of the following certifications to the DOB, with a copy provided to DDC:
- a. Asbestos Project Completion Form. If an asbestos project has been performed, a copy of the asbestos project completion form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.
 - b. An Asbestos Project Conditional Close-out Form. If an asbestos project has been performed a copy of the asbestos project conditional close-out form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

1.10 QUALITY ASSURANCE

- A. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industrial standards. All workmanship or work methods are subject to review and acceptance by the Construction Project Manager. Throughout the Specification, reference is made to codes and standards which establish qualities, levels or types of workmanship which will be considered acceptable. It is the asbestos abatement asbestos

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abatement contractor's responsibility to comply with these codes and standards during the execution of this work.

- B. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval as part of the asbestos abatement contractor's "Shop Drawings".
- C. It is the asbestos abatement a contractor's responsibility, when so required by the Specification or upon written request from the Commissioner or his representative to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose by DDC.
- D. The a asbestos abatement contractor shall furnish proof that employees working under his supervision have had instruction on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA regulations. This proof shall be in the form of a notarized affidavit to the effect that the above requirements have been satisfied.
- E. The a asbestos abatement contractor will have at all times in his possession and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos, and Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. He shall also have one copy of NYC Title 15, Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.
- F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the a asbestos abatement contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.
- G. Rejection of Non Complying Items: The Commissioner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. The Commissioner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount as approved by the City.
- H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:
 - 1. American National Standards Institute (ANSI)
(Successor to USASI and ASA)

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25 West 43rd Street (between 5th and 6th Avenue) 4th Floor
New York, NY 10036
212-642-4900

2. American Society for Testing and Materials (ASTM)
100 Bar Harbor Drive
West Conshohocken, PA 19428-2959
610-832-9500
3. National Institute for Occupational Safety and Health (NIOSH)
Robert A. Taft Laboratory
4676 Columbia Pkwy
Mailstop R12 Cincinnati, Ohio 45226
513-841-4428
4. National Electrical Code (NEC)
See NFPA
5. National Fire Protection Association (NFPA)
1 Batterymarch Park
Quincy, Massachusetts 02169-7471
617-770-3000
6. New York City Fire Department (FDNY)
9 Metrotech Center
Brooklyn, NY 11201-5431
718-999-2117
7. New York City Department of Buildings (NYC DOB)
Enforcement Division
280 Broadway, New York, New York 10007
212- 566-2850
8. New York City Department of Environmental Protection (NYCDEP)
Bureau of Environmental Compliance
Asbestos Control Program
59-17 Junction Boulevard, 8th Floor
Corona, New York 11368
718-595-3682
9. New York City Department of Health and Mental Hygiene (NYC DOHMH)
Environmental Investigation
125 Worth Street
New York, New York 10013
212-442-3372

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10. New York State Department of Labor (NYSDOL)
Division of Safety and Health
Engineering Services Unit
State Office Building Campus
Albany, New York 12240-0010
 11. New York City Department of Sanitation
125 Worth Street, Room 714
New York, New York 10013
212-566-1066
 12. Occupational Safety and Health Administration (OSHA)
Region II - Regional Office
201 Varick Street, Room 908
New York, New York 10014
212-337-2378
 13. United States Environmental Protection Agency (EPA or USEPA)
Region II
Asbestos NESHAPS Contact
Air and Waste Management Division
(Air Compliance Branch) – USEPA
290 Broadway, 21st Floor
New York, New York 10007-1866
212-637-3660
- I. Post all applicable regulations in a conspicuous place at the job site. Assure that the regulations are not altered, defaced or covered by other materials. One copy of each regulation must also be kept at the Asbestos abatement contractor's office.

1.11 CITY/ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

- A. The normal occupants of the Work Areas will be relocated by the City prior to the performance of the abatement work and returned there to at the conclusion of the abatement work, at no cost to the asbestos abatement contractor. However, the asbestos abatement contractor shall protect all furniture and equipment in the Work Areas in a manner as hereinafter specified. In addition, the asbestos abatement contractor shall perform the work of this Contract in a manner that will be least disruptive to the normal use of the non-Work Areas in the building.
- B. Asbestos abatement contractor shall be responsible for cleaning all portable items not specifically addressed by the Facility, in the Work Areas, or dispose of same as asbestos contaminated waste.
- C. Facility to provide asbestos abatement contractor with a list of items that cannot be removed and need special attention.

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- D. Facility to stop all deliveries that may be scheduled to the Work Area while work is in progress.
- E. Facilities to have authorized personnel on site at all times or supply the asbestos abatement contractor with means of contacting such personnel without unreasonable delay. Such personnel shall have access to all areas, have knowledge of electrical, and air handling equipment. Such personnel shall assist the asbestos abatement contractor in case of any power failure or breakdown to shut down air supply systems, to reset and control all protective systems such as alarms, sprinklers, locks, etc. The Facility shall ensure no active air handling systems are operating within the Work Area.
- F. City will not occupy the portions of the building, in which work is being performed during the entire asbestos removal operation, including completion of clean up.
- G. Asbestos abatement contractor shall provide a plan for 24 hour job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas.
- H. Asbestos abatement contractor shall provide surveillance by a fire watch and set forth procedures to be taken for the safety of building occupants in the event of an emergency, in accordance with the WPSP.
- I. Should the failure of any utility occur, the City will not be responsible to the asbestos abatement contractor for loss of time or any other expense incurred.
- J. Facility will be responsible to notify the asbestos abatement contractor of any planned electrical power shutdowns in order to ensure that there are no power interruptions in the negative air pressure systems.
- K. Asbestos abatement contractor shall remove all flammable materials from the work area and all sources of ignition (including but not limited to pilot lights) shall be extinguished.
- L. Asbestos abatement contractor shall require a competent person (as defined in OSHA 1926.1101) to perform the following functions and to be on-site continuously for the duration of the project:
 - 1. Monitor the set up of the Work Area enclosure and ensure its integrity.
 - 2. Control entry and exit into the work enclosure.
 - 3. Ensure that employees are adequately trained in the use of engineering controls, proper work practices, proper personal protective equipment and in decontamination procedures.

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4. Insure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.
5. The competent person (as defined in OSHA1926.1101) shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

1.12 USE OF BUILDING FACILITIES

- A. City shall make available to the asbestos abatement contractor, from existing outlets and supplies, all reasonably required amounts of water and electric power at no charge.
- B. Electric power to all Work Areas shall be shut down and locked out except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided by asbestos abatement contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. The Facility will identify all electric lines that must remain in service. Asbestos abatement contractor shall protect all lines.
- C. Asbestos abatement contractor shall provide, at his own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, asbestos abatement contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Asbestos abatement contractor shall ensure positive shutoff of all water to Work Area during non-working hours.
- D. Utilities:
 1. General:

All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting the work at any site; specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.
 2. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos

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abatement contractor and the cost thereof included in the Lump Sum price for abatement work. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the asbestos abatement contractor.

3. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work.

In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

A dedicated power supply for the negative pressure ventilating units shall be utilized. The negative air equipment shall be on a ground fault circuit interrupter (GFCI) protected circuit separate from the remainder of the work area temporary power circuits.

- E. Asbestos abatement contractor shall shut down and lock out all electric power to all work areas except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided in accordance with all applicable codes. Existing light sources (e.g., house lights) shall not be utilized. All power to work areas shall be brought in from outside the area through ground-fault circuit interrupter at the source.

- 1. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:
 - a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

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- b. Any energized circuits remaining in the work area shall be posted with a minimum two (2) inch high lettering warning sign which reads: DANGER LIVE ELECTRICAL - KEEP CLEAR. A sign shall be placed on all live covered barriers at a maximum of ten (10) foot intervals. These signs shall be posted in sufficient numbers to warn all persons authorized to enter the work area of the existence of the energized circuits.
- 2. Any source of emergency lighting which is temporarily blocked as a result of work place preparation shall be replaced for the duration of the project by battery operated or temporary exit signs, exit lights, or photo luminescent path markings.
- F. Asbestos abatement contractor shall provide a separate temporary electric panel board to power asbestos abatement contractor's equipment. The Facility will designate an existing electrical source in proximity to the Work Area. Asbestos abatement contractor's licensed electrician shall provide temporary tie-in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. The electric shut down for power panel tie-in will be on off-hours and must be coordinated with the Facility. Asbestos abatement contractor shall provide to the City a specification and drawing outlining his power requirements at the pre-construction meeting.
- G. Additional electrical equipment (i.e., transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the asbestos abatement contractor's expense.
- H. Asbestos abatement contractor shall provide fire protection in accordance with all State and Local fire codes.
- I. Sprinklers, standpipes, and other fire suppression systems shall remain in service and shall not be plasticized.
- J. When temporary service lines are no longer required, they shall be removed by the asbestos abatement asbestos abatement contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by the asbestos abatement asbestos abatement contractor. Senior Stationary Engineer will inspect and test all switches, controls, gauges, etc. and shall submit a list to the Construction Project Manager of any equipment damaged by the asbestos abatement asbestos abatement contractor.
- K. Asbestos abatement contractor shall supply hot shower water necessary for use in the decontamination unit.

1.13 USE OF THE PREMISES

- A. Asbestos abatement contractor shall confine his apparatus, the storage of materials, and supplies, and the operation of his workmen to limits established by law, ordinances, and the directions of the Construction Project Manager and the Facility. All flammable or combustible materials shall be properly stored to obviate fire and in areas approved by the Facility.
- B. Asbestos abatement contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that Work Areas are kept neat, clean, and safe.
- C. Asbestos abatement contractor shall maintain exits from the work area or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.
- D. If the openings of temporary structural partitions related to abatement work areas block egress, the partition shall consist of two sheets of fire retardant 6-mil plastic, prominently marked as an exit with photo luminescent paint or signage. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress.
- E. All surrounding work, fixtures, soil lines, drains, water lines, gas pipes, electrical conduit, wires, utilities, duct work railings, shrubbery, landscaping, etc. which are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the City, at no additional cost.
- F. All routes through the building to be used by the asbestos abatement contractor shall first be approved by the Construction Project Manager and the Facility.
- G. Attention is specifically drawn to the fact that other asbestos abatement contractors, performing the work of other Contracts, may be (or are) brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other asbestos abatement contractors who may be on (or are on) any site of the work of this Contract. Regulated area exempted.
- H. Temporary toilet facilities must be provided by the asbestos abatement contractor on the site. Coordinate location of facilities with Construction Project Manager. No toilet facilities will be allowed in the Work Area.

1.14 PROTECTION AND DAMAGE

- A. The asbestos abatement contractor is responsible to cover all furniture and equipment that cannot be removed from Work Areas. Moveable furniture and

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equipment will be removed from Work Areas by asbestos abatement contractor prior to start of work and returned upon successful completion of the final air testing. At the conclusion of the work (after clearance level of air testing reaches the acceptable limit), the asbestos abatement contractor will remove all plastic covering from the walls, floors, furniture, equipment and reinstall furniture and equipment in the cleaned Work Area. The asbestos abatement contractor shall remove all shades, curtains and drapes from the Work Area, and reinstall the same following the final clean up.

- B. Prior to plasticizing, the proposed work areas shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning methods. Methods that raise dust, such as sweeping or vacuuming with equipment not equipped with HEPA filters, are prohibited.
- C. Use rubber tired vehicles that use non-volatile fuels for conveying material inside building and provide temporary covering, as necessary, to protect floors.
- D. No materials or debris shall be thrown from windows or doors of the building. Building waste system shall NOT be used to remove refuse.
- E. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited bag storage may take place within the Work Area when approved by the Construction Project Manager.
- F. Protect floors and walls along removal routes from damage, wear and staining with contamination control flooring. All finished surfaces to be protected with Masonite or other rigid sheathing material.
- G. A preliminary inspection for pre-existing damage shall be conducted by asbestos abatement contractor and representative of the City before commencement of the project.

1.15 RESPIRATORY PROTECTION REQUIREMENTS

- A. Respiratory protection shall be worn by all individuals who may be exposed to asbestos fibers from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring in accordance with Regulations and these Specifications.
- B. Asbestos abatement contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134, at a minimum.

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- C. The Asbestos abatement contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein.
- D. Where respirators with disposable filter parts are employed, the asbestos abatement contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.
- E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by asbestos abatement contractor, and used by workers in conjunction with the written respiratory protection program.
- F. Asbestos abatement contractor shall provide respirators selected by an Industrial Hygienist that meet the following requirements:

Table 1. -- Assigned Protection Factors

Type of Respirator	Half mask	Full facepiece	Helmet/hood
1. Air-Purifying Respirator	³ 10	50	.....
2. Powered Air-Purifying Respirator (PAPR)	50	1,000	⁴ 25/1,000
3. Supplied-Air Respirator (SAR) or Airline Respirator			
• Demand mode	10	50	.....
• Continuous flow mode	50	1,000	⁴ 25/1,000
• Pressure-demand or other positive-pressure mode	50	1,000	.....
4. Self-Contained Breathing Apparatus (SCBA)			
• Demand mode	10	50	50
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	10,000	10,000

Notes:

¹Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

²The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

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³This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

⁴The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

⁵These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

G. Selection of high efficiency filters:

1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.
2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.
 - a. N-series filters shall only be used for non-oil solid and water based aerosols or fumes.
 - b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.
 - c. Follow filter manufacture recommendations.
3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.

H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the asbestos abatement contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. Documentation of aforementioned results may be requested by the City and/or Third-Party Air Monitor for review. This will not relieve the asbestos abatement contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.

I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted, and reviewed by the Construction Project Manager. If the TWA and

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excursion limit have not been conducted, a Supplied-Air Respirator (SAR) or Airline Respirator or Self-Contained Breathing Apparatus (SCBA) must be used. Use of single use dust respirators is prohibited for the above respiratory protection.

- J. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.
- K. Asbestos abatement contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.
- L. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.
- M. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.
- N. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the asbestos abatement contractor at the asbestos abatement contractor's expense.
- O. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:
 - 1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and
 - 2. High efficiency filters for negative pressure respirators shall be changed after each shower; and
 - 3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.
 - 4. Airline respirators with high efficiency filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and
 - 5. Respirators shall be stored in a dry place and in such a manner that the face-piece and exhalation valves are not distorted; and
 - 6. Organic solvents shall not be used for washing of respirators.

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- P. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

1.16 PROTECTIVE CLOTHING

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.
- B. In addition to personal protective equipment for workers, the asbestos abatement contractor shall make available at each worksite at least four (4) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager. In addition to respiratory masks for workers, the asbestos abatement contractor must have on hand at the beginning of each work day, at least four (4) masks each with two sets of fresh filters, for use by personnel who are authorized to inspect the worksite. The asbestos abatement contractor shall check for proper fit of the respirators of all City personnel authorized to enter the Work Area.
- C. Asbestos handlers involved in tent procedures shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. All street clothes shall be removed and stored in a clean room within the work site. The double layer personal protective equipment shall be used for installation of the tent and throughout the procedure, if a decontamination unit (with shower and clean room) is contiguous to the Work Area, only one (1) layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.
- D. The outer disposable suit (if 2 suits are worn) shall be removed and remain in the tent upon exiting. Following the tent disposal and work site clean up the workers shall immediately proceed to a shower at the work site. The inner disposal unit and respirator shall be removed in the shower after appropriate wetting. The disposal clothing shall be disposed of as asbestos-containing waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean dry towels.
- E. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.
- F. Boots: provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all

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boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated with ACM and/or dust.

- G. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Label all hats with same warning label as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work.
- H. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.
- I. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as asbestos-asbestos contaminated waste at the end of the work. Gloves shall be worn at all times, except during Work Area Preparation activities that do not disturb ACM.
- J. Reusable footwear, hard hats and eye protection devices shall be left in the contaminated Equipment Room until the end of the Asbestos Abatement Work.
- K. Disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facility.
- L. Respirators, disposable coveralls, head covers and foot covers shall be provided by the asbestos abatement contractor for the Facilities Representative, Construction Project Manager and any other authorized representative who may inspect the Work Area. Provide two respirators and six respirator filter changes per day.

1.17 AIR MONITORING - ASBESTOS ABATEMENT CONTRACTOR

- A. Asbestos abatement contractor shall employ a qualified industrial hygiene laboratory to analyze air samples in accordance with OSHA Regulations, 1926.1101 (Asbestos Standards for Construction) and New York City regulations.
- B. The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

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- C. Industrial hygiene laboratory shall also be a current proficient participant in the NIST/NVLAP Quality Assurance Program for the identification of bulk samples. Laboratory identification number shall be submitted to and approved by the City.
- D. Air monitoring responsibilities for the asbestos abatement contractor's employees, shall be performed by a representative of the industrial hygiene laboratory retained by the asbestos abatement contractor.
- E. Asbestos abatement contractor shall submit to the City all credentials of the designated (as defined in OSHA 1926.1101) and industrial hygiene laboratory representative for approval.
- F. Air monitoring and inspection shall be conducted by the Asbestos abatement contractor's competent person (as defined in OSHA 1926.1101).
- G. Continuous (daily or per shift) monitoring and inspection will include Work Area samples, personnel samples from the breathing zone of a worker to accurately determine the employees' 8-hour TWA (unless Type C respirators are used) and decontamination unit clean room samples.
- H. Work Area samples and employee personnel samples shall be taken using pumps whose flow rates can be determined to an accuracy of +5-percent, at a minimum of two liters per minute. This must be demonstrated at the job site.
- I. Sampling and analysis methods shall be per NIOSH 7400A.
- J. Test Reports:
 - 1. Promptly process and distribute one copy of the test results, to the Commissioner.
 - 2. Prompt reports are necessary so that if required, modifications to work methods and/or practices may be implemented as soon as possible.
 - 3. Asbestos abatement contractor shall by facsimile notify the Commissioner within 24 hours of the results of each test, followed by written notification within three days.
- K. Competent person shall conduct inspections and provide written reports daily. Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project which may affect the health and safety of the people and environment.
- L. All costs for required air monitoring by the asbestos abatement contractor's competent person shall be borne by the asbestos abatement contractor.

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- M. The City reserves the right to conduct air and surface dust sampling in conjunction with and separate from the Third-Party Air Monitor for the purposes of Quality Assurance.
- N. All samples shall be accompanied by a Chain of Custody Record that shall be submitted to the Construction Project Manager upon completion of analysis.

1.18 THIRD PARTY MONITORING AND LABORATORY

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM). This laboratory shall meet the standards stated in Paragraph 1.17. B.
- C. Observations will include, but not be limited to, checking the standard operating procedures, engineering control systems, respiratory protection, decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the environment, Asbestos abatement contractor, and/or facility occupants.
- D. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- E. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.
- F. At a minimum, air sampling shall be conducted in accordance with the following schedule:

Abatement Activity	Pre- Abatement	During Abatement	Post- Abatement
Equal to or greater than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	TEM
Less than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	PCM

Note: TEM is acceptable wherever PCM is required.

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- G. The number of air samples required per stage of abatement and size of abatement project is listed in the table below:

		Pre-Abatement	During Abatement	Post Abatement
Large Asbestos Projects				
1.	Full Containment	10	5	10
2.	Glovebag inside Tent	5 ^a	5 ^a	5 ^a
3.	Exterior Foam and Vertical Surfaces	-	5 ^c	5 ^d
4.	Interior Foam	10	5 ^c	10 ^d
Small Asbestos Projects				
1.	Full Containment	6	3	6
2.	Glovebag inside Tent	3 ^b	3 ^b	3 ^b
3.	Tent	3 ^b	3 ^b	3 ^b
4.	Exterior Foam and Vertical Surfaces	-	3 ^c	3 ^d
5.	Interior Foam	6	3 ^c	6 ^d
Minor Projects				
1.	Glovebag inside Tent	-	-	1 ^d
2.	Tent	-	-	1 ^d
3.	Exterior Foam and Vertical Surfaces	-	-	1 ^d
4.	Interior Foam	-	-	1 ^d

Notes:

- a. if more than three (3) tents then two (2) samples required per enclosure.
- b. if more than three (3) tents then one (1) sample required per enclosure.
- c. samples shall be taken within the work area(s).
- d. area sampling is required only if:
 - visible emissions are detected during the project
 - during-abatement area sampling results exceeded 0.01 f/cc or the pre-abatement area sampling result(s) for interior projects where applicable.
 - work area to be reoccupied is an interior space at a school, healthcare, or daycare facility.

- H. Prior to commencement of abatement activities, the Third Party Air Monitoring Firm will collect a minimum number of area samples inside each homogeneous work area.

1. Samples will be taken during normal occupancy activities and circumstances at the work site.

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2. Samplers shall be located within the proposed work area and at all proposed isolation barrier locations.
 3. Samples shall be analyzed using PCM.
 4. The number of samples to be collected will be determined by the size of the project and the abatement methods to be utilized.
- I. Frequency and duration of the air sampling during abatement shall be representative of the actual conditions during the abatement. The size of the asbestos project will be a factor in the number of samples required to monitor the abatement activities. The following minimum schedule of samples shall be required daily.
1. For large asbestos projects employing full containment, area air sampling shall be performed at the following locations:
 - a. Two area samples outside the work area in uncontaminated areas of the building, remote from the decontamination facilities.
 - (1) Primary location selection shall be within 10 feet of isolation barriers.
 - (2) Where negative ventilation exhaust runs through uncontaminated building areas, one of the area samples will be required in these areas to monitor any potential fiber release.
 - (3) Where exhaust tubes have been grouped together in banks of up to five (5) tubes, with each tube exhausting separately and the bank of tubes terminating together at the same controlled area, one area air sample shall be taken.
 - b. One area sample within the uncontaminated entrance to each decontamination enclosure system.
 - c. Where adjacent non-work areas do not exist, an exterior area sample shall be taken.
 - d. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct.
 - e. One area sample outside, but within 25 feet of, the building or structure, if the entire building or structure is the work area.

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2. For large asbestos projects involving interior foam method, area air sampling shall be performed at the following sampling locations:
 - a. One area sample taken outside the work area within 10 feet of isolation barriers.
 - b. One area sample taken within the uncontaminated entrance to each worker decontamination and waste decontamination enclosure system.
 - c. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct, if applicable.
 - d. Three area samples inside the work area.
 - e. One area sample where the negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
3. For large asbestos projects employing the glovebag procedure within a tent, a minimum of five continuous air samples shall be taken concurrently with the abatement for each work area, unless there are more than three enclosures, in which case two area samples per enclosure are required.
 - a. Four area samples taken outside the work area within ten feet of tent enclosure(s).
 - b. One area sample taken within the uncontaminated entrance to each worker and waste decontamination enclosure system.
 - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
 - d. One area sample where negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
4. For large asbestos projects involving exterior foam method or removal of ACM from vertical surfaces, a minimum of five continuous area samples shall be taken concurrently with the abatement for each work area using the following minimum requirements:
 - a. Three area samples inside the work area and remote from the decontamination systems.

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- b. One area sample within the uncontaminated entrance to each worker and waste decontamination enclosure system.
 - c. One area sample outside the work area within 25 feet of the building or structure, if the entire building or structure is the work area.
 - d. One area sample inside the building or structure at the egress point to the work area, if applicable.
- 5. For small asbestos projects employing full containment, a minimum of three continuous area samples shall be taken concurrently with the abatement for each work area at the following locations:
 - a. Two area samples taken outside the work area within ten feet of the isolation barriers.
 - b. One area sample within the uncontaminated entrance to each worker or waste decontamination enclosure system.
 - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
 - d. One area sample where negative ventilation exhaust ducting runs through an uncontaminated building area, if applicable.
- 6. Tent Procedures:

For projects involving more than 25 linear feet or 10 square feet, a minimum of three continuous samples shall be taken concurrently throughout abatement.
- J. Post-abatement clearance air monitoring for projects not solely employing glove-bag procedures shall include a minimum number of area samples inside each homogeneous work area and outside each homogeneous work area (five samples inside/five samples outside for Large Projects and three samples inside/three samples outside for Small Projects). In addition to the five sample inside/five sample outside minimum for Large Projects, one additional representative area sample shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.
- K. Post-abatement clearance air monitoring for Small Projects solely employing glove-bag procedures is not required unless one or more of the following events occurs. In such cases, post-abatement clearance air monitoring procedures shall be followed. The events requiring post-abatement clearance air monitoring are:
 - 1. The integrity of the glove-bag was compromised,

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2. Visible emissions are detected outside the glove-bag, and/or
 3. Ambient levels exceed 0.01 f/cc during abatement.
- L. Monitoring requirements for other than post-abatement clearance air monitoring are as follows:
1. The sampling zone for indoor air samples shall be representative of the building occupants' breathing zone.
 2. If possible, outdoor ambient and baseline samplers should be placed about 6 feet above the ground surface in reasonable proximity to the building and away from obstructions and drafts that may unduly affect airflow.
 3. For outdoor samples, if access to electricity and concerns about security dictate a rooftop site, locations near vents and other structures on the roof that would unduly affect airflow shall be avoided.
 4. Air sampling equipment shall not be placed in corners of rooms or near obstructions such as furniture.
 5. Samples shall have a chain of custody record.
- M. Area air sampling during abatement shall be conducted as specified in the following documents except as restricted or modified herein:
1. Measuring Airborne Asbestos Following an Abatement Action, US EPA document 600/4-85-049 (Nov., 1985);
 2. Guidance for Controlling Asbestos-Containing Materials in Buildings; US EPA Publication 560/5-85-024 (June, 1984);
 3. Methodology for the Measurement of Airborne Asbestos by Electron Microscopy US EPA Contract No. 68-02-3266;
 4. Mandatory and non-mandatory Electron Microscopy Methods set forth in 40 CFR Part 763, Subpart E, Appendix A.
 5. NIOSH 7400 method using "A" counting rules

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- N. In accordance with the above criteria, area samples (see NYCDEP Asbestos Control Program Regulations) shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM, 25mm cassettes	560 liters	5 to 15 liters/minute
TEM, 25mm cassettes	560 liters	1 to 10 liters/minute
TEM, 37mm cassettes	1,250 liters	1 to 10 liters/minute

- O. Post-abatement clearance air monitoring requirements are as follows:

1. Sampling shall not begin until at least one hour after wet cleaning has been completed and no visible pools of water or condensation remain.
2. Samplers shall be placed at random around the work area. If the work area contains the number of rooms equivalent to the number of required samples based on floor area, a sampler shall be placed in each room. When the number of rooms is greater than the required number of samples, a representative sample of rooms shall be selected.
3. The representative samplers placed outside the work area but within the building shall be located to avoid any air that might escape through the isolation barriers and shall be approximately 50 feet from the entrance to the work area, and 25 feet from the isolation barriers.

- P. The following aggressive sampling procedures shall be used within the work area during all clearance air monitoring:

1. Before starting the sampling pumps, use forced air equipment (such as a one horsepower leaf blower) to direct exhaust air against all walls, ceilings, floors, ledges and other surfaces in the work area. This pre-sampling procedure shall take at least five minutes per 1,000 square feet of floor area; then
2. Place a 20-inch diameter fan in the center of the room. Use one fan per 10,000 cubic feet of room space. Place the fan on slow speed and point it toward the ceiling.
3. Start the sampling pumps and sample for the required time or volume.
4. Turn off the pump and then the fan(s) when sampling is completed.

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5. Collect a minimum number of area samples inside and outside each homogeneous work area (five inside/five outside samples for Large Projects and three inside/three outside samples for Small Projects). In addition to the minimum for Large Projects, one representative area samples shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.

Q. For post-abatement monitoring, area samples shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM	1,800 liters	5 to 15 liters/minute
TEM	1,250 liters	1 to 10 liters/minute

1. Each homogeneous work area that does not meet the clearance criteria shall be thoroughly re-cleaned using wet methods, with the negative pressure ventilation system in operation. New samples shall be collected in the work area as described above. The process shall be repeated until the work site meets the clearance criteria.
2. For an asbestos project with more than one homogeneous work area, the release criterion shall be applied independently to each work area.
3. Should airborne fiber concentrations exceed the clearance criteria, the asbestos abatement contractor shall re-clean the work area utilizing wet wiping and HEPA-vacuuming techniques. Following completion of re-cleaning activities, the Third-Party Air Monitor will perform an observation of the Work Area. If the Third-Party Air Monitor determines that the work was performed in accordance with the specifications, the appropriate settling period will be observed and additional air sampling will be performed.
4. All costs resulting from additional air tests and observations shall be borne by the asbestos abatement contractor. These costs may include, but are not limited to, labor, analysis fees, materials, and expenses.
5. After the area has been found to be in compliance, the asbestos abatement contractor may remove Isolation Barriers and perform final cleaning as specified.

R. Clearance and/or Re-occupancy Criteria:

1. The clearance criteria shall be applied to each homogeneous work area independently.

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2. For PCM analysis, the clearance air monitoring shall be considered satisfactory when each of the 5 inside/5 outside samples for Large Projects and/or 3 inside/3 outside samples for Small Projects is less than or equal to 0.01 f/cc or the background concentrations, whichever is greater.
3. For TEM analysis, the clearance air monitoring shall be considered satisfactory when the requirements stated in 40 CFR Part 763, Subpart E, Appendix A, Section IV are met.
4. As soon as the air monitoring tests are completed, the Third-Party Air Monitor will send the results of such tests to the City and notify the Asbestos abatement contractor.
5. The asbestos abatement contractor shall initiate the appropriate closeout information into the DEP ARTS database within 24 hours of work area completion to allow the Third Party Air Monitoring Firm to complete and submit the ACP-15 forms for each specific work area.
6. The asbestos abatement contractor shall provide the ACP-20 and ACP-21 forms to the Third Party Air Monitoring Firm within 48 hours of receipt.

1.19 TAMPERING WITH TEST EQUIPMENT

All parties to this Contract are hereby notified that any tampering with testing equipment will be considered an attempt at falsifying reports and records to federal and state agencies and each offense will be prosecuted under applicable state and federal criminal codes to the fullest extent possible.

1.20 GUARANTEE

- A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the City.
- B. The asbestos abatement contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the Commissioner.
- C. The City will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

PART 2 – PRODUCTS

2.01 MATERIAL HANDLING

- A. Deliver all materials to the job site in their manufacturer's original container, with the manufacturer's label intact and legible.

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1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 2. Store all materials on pallets, away from any damp and/or wet surface. Cover materials in order to prevent damage and/or contamination.
 3. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.
- B. The Construction Project Manager may reject as non-complying such material and products that do not bear identification satisfactory to the Construction Project Manager as to manufacturer, grade, quality and other pertinent information.

2.02 MATERIALS

- A. Wetting agents: (Surfactant) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.
- B. Encapsulants: Liquid material which can be applied to asbestos-containing material which temporarily controls the possible release of asbestos fibers from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
- C. During abatement activities, replacement materials shall be stored outside the work area in a manner to prevent contamination. Materials required for the asbestos project (i.e., plastic sheeting, replacement filters, duct tape, etc.) shall be stored to prevent damage or contamination.
- D. Framing Materials and Doors: As required to construct temporary decontamination facilities and isolation barriers. Lumber shall be high grade, new, finished one side and fire retardant.
- E. Fire Retardant Polyethylene Sheeting: minimum uniform thickness of 6-mil. Provide largest size possible to minimize seams. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.
- F. Fire Retardant Reinforced Polyethylene Sheeting: For covering floor of decontamination units, provide translucent, nylon reinforced or woven polyethylene laminated, fire retardant polyethylene sheeting. Provide largest size possible to minimize seams, minimum uniform thickness 6-mil. All materials used

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in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

- G. Drums: Asbestos-transporting drums, sealable and clearly marked with warning labels as required by OSHA and EPA.
- H. Polyethylene Disposal Bags: Asbestos disposal bags, minimum of fire retardant 6-mil thick. Bags shall be clearly marked with warning labels as required by OSHA and EPA.
- I. Signs: Asbestos warning signs for posting at perimeter of Work Area, as required by OSHA and EPA.
- J. Waste Container Bag Liners and Flexible Trailer Trays: One piece leak-resistant flexible tray with absorbent pad.
- K. Tape: Provide tape which is of high quality with an adhesive that is formulated to aggressively stick to sheet polyethylene.
- L. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- M. Flexible Duct: Spiral reinforced flex duct for air filtration devices.
- N. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high boot-type foot covers. Protective clothing shall conform to OSHA Standard 29 CFR 1926.1101.
- O. Surfactants, strippers, sealers, or any other chemicals used shall be non-carcinogenic and non-toxic.
- P. Materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

2.03 TOOLS AND EQUIPMENT

- A. Air Filtration Device (AFD): AFDs shall be equipped with High Efficiency Particulate Air (HEPA) filtration systems and shall be approved by and listed with Underwriter's Laboratory.
- B. Scaffolding: All scaffolding shall be designed and constructed in accordance with OSHA (29 CFR 1926/1910), New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. All scaffolding and components shall be capable of supporting without failure a minimum of four times the maximum intended load, plus an allowance

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for impact. All scaffolding and staging must be certified in writing by a Professional Engineer licensed to practice in the State of New York.

1. Equip rungs of all metal ladders, etc., with an abrasive, non-slip surface.
 2. Provide non-skid surface on all scaffold surfaces subject to foot traffic. Scaffold ends and joints shall be sealed with tape to prevent penetration of asbestos fibers.
- C. Transportation Equipment: Transportation Equipment, as required, shall be suitable for loading, temporary storage, transit and unloading of asbestos contaminated waste without exposure to persons or property. Any temporary storage containers positioned outside the building for temporary storage shall be metal, closed and locked.
- D. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems.
- E. Vacuum Attachments: Soft Brush Attachment, Asbestos Scraper Tool, Drill Dust Control Kit.
- F. Electric Sprayer: An electric airless sprayer suitable for application of encapsulating material and shall be approved by and listed with Underwriters Laboratory.
- G. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.
- H. Water Atomizer: Powered air-misting device equipped with a ground fault interrupter and equipped to operate continuously.
- I. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small, fine fibers. Wire brushes maybe used for cleaning pipe joints within glove-bags upon written approval of the Construction Project Manager.
- J. Power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation. Abrasive removal methods, including the use of beadblasters, are prohibited.
- K. Other Tools and Equipment: Asbestos abatement contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, sponges, rounded-edge shovels, brooms, and carts.

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- L. Fans and Leaf Blower: Provide Leaf Blower (one leaf blower per floor) and one 20-inch diameter fans for each 10,000 cubic feet of Work Area volume to be used for aggressive sampling technique for clearance air testing.
- M. Fire Extinguishers: At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.
- N. First Aid Kits: Asbestos abatement contractor shall maintain adequately stocked first aid kits in the clean rooms of the decontamination units and within Work Areas. The first aid kit shall be approved by a licensed physician for the work to be performed under this Contract.
- O. Water Service:
 - 1. Temporary Water Service Connection: All connections to the Facilities water system shall include back flow protection. Valves shall be temperature and pressure rated for operation of the temperature and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping, and equipment. Leaking or dripping fittings/valves shall be repaired and or replaced as required.
 - 2. Water Hoses: Employ new heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each Work Area and to each Decontamination Enclosure Unit. Provide fittings as required for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.
 - 3. Water Heater: Provide UL rated 40-gallon electric water heaters to supply hot water for Personal Decontamination Enclosure System Shower. Activate from 30 Amp Circuit breakers located within the Decontamination Enclosure sub panel. Provide relief valve compatible with water heater operations, pipe relief valve down to drip pan at floor level with type 'L' copper piping. Drip pans shall be 6-inch deep and securely fastened to water heater. Wiring of the water heater shall comply with NEMA, NECA, and UL standards.
- P. Electrical Service:
 - 1. General: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.
 - 2. Temporary Power: Provide service to decontamination unit sub panel with minimum 60 AMP, two pole circuit breaker or fused disconnect connected to the building's main distribution panel. Sub panel and disconnect shall be

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sized and equipped to accommodate all electrical equipment required for completion of the work.

3. Voltage Differences: Provide identification warning signs at power outlets that are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
4. Ground Fault Protection: Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate the GFCIs outside the Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in Work Area, decontamination units, exterior, or as otherwise required by NEC, OSHA or other authority.
5. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.
6. Temporary Wiring: In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.
7. Electrical Power Cords: Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.
8. Temporary Lighting: All lighting within the Work Area shall be liquid and moisture proof and designed for the use intended.
 - a. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
 - b. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.
9. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:
 - a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered

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with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

2.04 CLEANING

A. Throughout the construction period, the asbestos abatement contractor shall maintain the building as described in this Section.

1. The asbestos abatement contractor shall prevent building areas other than the Work Area from becoming contaminated with asbestos-containing dust or debris. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement contractor's work practices, the asbestos abatement contractor shall be responsible for cleaning these areas in accordance with the procedures appended in Title 15, Chapter 1 of RCNY and NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the asbestos abatement contractor at no additional cost to the City.
2. The asbestos abatement contractor shall provide to all personnel and laborers the required equipment and materials needed to maintain the specified standard of cleanliness.

B. General

1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is on operation to remove asbestos fibers.
2. Asbestos wastes shall be double bagged in six mil (.006") fire retardant polyethylene bags approved for ACM disposal and shall be properly labeled and handled before disposal.
3. All waste generated shall be bagged, wrapped or containerized immediately upon removal. The personal and waste decontamination enclosure systems and floor and scaffold surfaces shall be HEPA vacuumed and wet cleaned at the end of each work shift at a minimum.
4. The asbestos abatement contractor shall use corrugated cartons or drums for disposal of asbestos-containing waste having sharp edged components (e.g., nails, screws, metal lathe and tin sheeting) that may tear polyethylene bags and sheeting. The waste within the drums or cartons must be double bagged.

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5. The asbestos abatement contractor shall transport all bags of waste to disposal site in thirty gallon capacity metal or fiber drums with tight lids, or in locked steel dumpster.
6. Dumping of debris, waste or bagged waste will not be permitted.
7. The waste decontamination enclosure system shall be wet cleaned twice using wet cleaning methods upon completion of waste removal. When the worker decontamination enclosure shower room alternates as a waste container wash room, the shower room shall be washed immediately with cloths or mops saturated with a detergent solution prior to wet cleaning.
8. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
9. ACM shall be collected utilizing rubber dust pans and rubber squeegees.
10. HEPA vacuums shall not be used on wet materials unless specifically designed for that purpose.
11. Metal shovels shall not be used within the work area.
12. Mastic solvent when used will be applied in moderation (e.g., by airless sprayer). Saturation of the concrete floor with mastic solvent must be avoided.
13. The asbestos abatement contractor shall retain all items in the storage area in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of all materials.
14. The asbestos abatement contractor shall not allow accumulation of scrap, debris, waste material, and other items not required for use in this work. When asbestos contaminated waste must be kept on the work site overnight or longer, it shall be double bagged and stored in accordance with New York City Department of Sanitation (NYCDOS) regulation Title 16 Chapter 8, and Federal, State and City laws.
15. At least twice a week (more if necessary), the asbestos abatement contractor shall completely remove all scrap, debris and waste material from the job site.
16. The asbestos abatement contractor shall provide adequate storage space for all items awaiting removal from the job site, observing all requirements for fire protection and concerns for the environment.
17. All respiratory protection equipment shall be selected from the latest NIOSH Certified Equipment list.

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18. Daily and more often, if necessary, the asbestos abatement contractor shall inspect the Work Areas and adjoining spaces, and pick up all scrap, debris, and waste material. All such items shall be removed to the place designated for their storage.
19. Weekly, and more often, if necessary, the asbestos abatement contractor shall inspect all arrangements of materials stored on the site; re-stack and tidy them or otherwise service them to meet the requirements of these Specifications.
20. The asbestos abatement contractor shall maintain the site in a neat and orderly condition at all times.

PART 3 – EXECUTION

3.01 WORKER DECONTAMINATION FACILITY

A. Large Asbestos Projects (Small Project Option):

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas
 - a. Structure:
 - (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
 - (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
 - (3) Interior shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of twelve inches.
 - (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered

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to allow for air movement through the decontamination units into Work Area.

- b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
- d. Decontamination Enclosure System shall be placed adjacent to the Work Area and shall consist of three totally enclosed chambers, separated from Work Area and each other by airlocks, as follows:
 - (1) Equipment Room: The equipment room shall have a curtain doorway to separate it from the Work Area, and share a common airlock with the shower room. The equipment room shall be large enough to accommodate at least one worker (allowing them enough room to remove their protective clothing and footwear), and a fire retardant 6-mil disposal bag for collection of discarded clothing and equipment. The equipment room shall be utilized for the storage of equipment and tools after decontamination using a HEPA-vacuum and/or wet cleaning. A one-day supply of replacement filters, in sealed containers, for HEPA-vacuums and negative air machines, extra tools, containers of surfactant, and other materials and equipment required for the project shall be stored here. A walk-off pan filled with water shall be placed in the Work Area just outside the equipment room for persons to clean foot coverings when leaving the Work Area. Contaminated footwear and reusable work clothing shall be stored in this room.
 - (2) Shower Room: The shower room shall have two airlocks (one that separates it from the equipment room and one that separates it from the clean room). The shower room shall contain at least one shower, with hot and cold water adjustable at the tap, per six workers. Careful attention shall be given to the shower to ensure against leaking of any kind and shall contain a rigid catch basin at least six inches deep. Asbestos abatement contractor shall supply towels, shampoo and liquid soap in the shower room at all times. Shower water shall be continuously drained, collected, and filtered through a system with at least a 5-micron particle size collection capacity. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filters by large particles. Pumps shall be installed, maintained

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and utilized in accordance with manufacturer's recommendations. Filtered water shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste.

- (3) Clean Room: The clean room shall share a common airlock with the shower room and shall have a curtained doorway to separate it from outside non-contaminated areas. Lockers, for storage of workers' street clothing, and shelves, for storing respirators, shall be provided in this area. Clean disposable clothing, replacement filters for respirators, and clean dry towels shall be provided in the clean room. The clean room shall not be used for the storage of tool, equipment or other materials.

B. Small Asbestos Projects:

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.
2. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.
3. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

- C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

3.02 WASTE DECONTAMINATION FACILITY

A. Large Asbestos Project (Small Project Option)

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.

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- a. Structure:
 - (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
 - (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
 - (3) Interior walls shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of twelve inches.
 - (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into the Work Area.
- b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
- d. Decontamination Enclosure System shall be located outside the work area and attached to all locations through which ACM waste will be removed from the work area and shall consist of two totally enclosed chambers, separated from the Work Area and each other by airlocks, as follows:
 - (1) Washroom: An equipment washroom shall have two air locks (one separating the unit from the Work Area and one common air lock that separates it from the holding area). The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the Work Area, prior to moving to the washroom.

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- (2) Holding Area: A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door shall be placed at the holding area entrance to prevent unauthorized access into the Work Area.

B. Small Asbestos Project:

1. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.
2. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

- C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

3.03 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING REMOTE DECONTAMINATION FACILITIES

- A. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall fully identify the facility, agents, asbestos abatement contractor(s), the project, each Work Area, and worker respiratory protection employed. The job supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.
- B. Each worker shall remove street clothes in the clean room; wear two disposable suits, including gloves, hoods and non-skid footwear; and put on a clean respirator (with new filters) before entering the Work Area.
- C. Each worker shall, before leaving the Work Area or tent, clean the outside of the respirators and outer layer of protective clothing by wet cleaning and/or HEPA-vacuuming. The outer disposable suit shall be removed in the airlock prior to proceeding to the Worker Decontamination Unit. The inner disposable suit and respirator shall be wet wiped and HEPA vacuumed thoroughly before removing and prior to aggressive shower.

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- D. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately.

3.04 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING ATTACHED DECONTAMINATION FACILITIES

- A. All workers and authorized visitors shall enter the Work Area through the worker decontamination facility.
- B. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, asbestos abatement contractor(s), the project, each Work Area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.
- C. Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator with filters, and clean protective clothing before entering the Work Area through the shower room and equipment room.
- D. Each worker or authorized visitor shall, each time he leaves the Work Area, remove gross contamination from clothing before leaving the Work Area; proceed to the equipment room and remove clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- E. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the Work Area is not permitted outside the Work Area.

3.05 MAINTENANCE OF DECONTAMINATION ENCLOSURE FACILITIES AND BARRIERS

The following procedures shall be followed during abatement activities.

- A. All polyethylene barriers inside the work place and partitions constructed to isolate the Work Area from occupied areas shall be inspected by the asbestos handler supervisor at least twice per shift.

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- B. Smoke tubes shall be used to test the integrity of the Work Area barriers and the decontamination enclosure systems daily before abatement activity begins and at the end of each shift.
- C. Damage and defects in the decontamination enclosure system shall be repaired immediately upon discovery. The decontamination enclosure system shall be maintained in a clean and sanitary condition at all times.
- D. At any time during the abatement activity, if visible emissions are observed, or elevated asbestos fiber counts outside the Work Area are measured, or if damage occurs to barriers, abatement shall stop. The source of the contamination shall be located, the integrity of the barriers shall be restored and extended to include the contaminated area, and visible residue shall be cleaned up using appropriate HEPA-vacuuming and wet cleaning.
- E. Inspections and observations shall be documented in the daily project log by the asbestos handler supervisor.
- F. The daily inspection to ensure that exits have been checked against exterior blockage or impediments to exiting shall be documented in the log book. If exits are found to be blocked, abatement activities shall stop until the blockage is cleared.

3.06 MODIFICATIONS TO HVAC SYSTEMS

- A. Shut down, isolate or seal, all existing HVAC units, fans, exhaust fans, perimeter convection air units, supply and/or return air ducts, etc., situated in, traversing or servicing the work zone.
- B. Seal all seams with duct tap. Wrap entire duct with a minimum of two layers of fire retardant 6-mil polyethylene sheeting. All shutdowns are to be coordinated with the Facility. Where systems must be maintained, i.e., traversing Work Areas to non-Work Areas, only supply ducts will be maintained, protect as described above. All returns must be blanked off in Work Area and adjacent areas, including floor above and below Work Area. When required Asbestos abatement contractor shall apply for a clarification from NYCDEP. The Asbestos abatement contractor shall implement the following engineering procedures:
 - 1. Maintenance of a positive pressure within the HVAC system of 0.01 inch water gauge (or greater) with respect to the ambient pressure outside the Work Area. The conditions for this system shall be maintained and be operational 24 hours per day from the initiation of Work Area preparation until successful final air clearance. Positive pressurization of HVAC system shall be applied only under the direction and control of professional engineer, or other knowledgeable licensed professional;

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2. The positive pressurization of the duct shall be tested, inspected and recorded both at the beginning and at the end of each shift;
 3. The positive pressurization shall be monitored using instrumentation which will provide a written record of pressurization and that will trigger an audible alarm, if the static pressure falls below the set value;
 4. The supply air fan and the supply air damper for the active positive-pressurized duct shall be placed in the manual "on" positions to prevent shutdown by fail-safe mechanisms;
 5. The return air fan and the return air dampers shall be shut down and locked-out;
 6. All the seams of the HVAC ducts that pass through the Work Area shall be sealed;
 7. The HVAC ducts that pass through the Work Area shall be covered with two (2) layers of fire retardant 6-mil polyethylene sheeting, and all seams and edges of both layers shall be sealed airtight;
 8. The supply air fans, return air fans, and all dampers servicing the Work Area itself shall be shut down and locked-out. All openings within the Work Area of supply and return air ducts shall be sealed with 3/8-inch fire rated plywood and two layers of fire retardant 6-mil polyethylene;
 9. When abatement occurs during periods while the HVAC system is shut down an alternative method of pressurization of the duct passing through the Work Area should be employed (e.g., by low-pressure "blowers", etc., directly coupled into the duct). Item #4 above shall be deleted and shall be replaced by the requirement to set the dampers of the HVAC duct in the manual closed positions, in order to effect pressurization.
- C. Asbestos abatement contractor to coordinate this item with the Facility and Construction Project Manager at the commencement of work. Where present HVAC systems (ducts) service an area and that air system cannot be shut down, asbestos abatement contractor shall isolate and seal the ducts, both supply and return, at the boundary of that zone.
1. To isolate, cap, or seal a duct, the asbestos abatement contractor shall remove insulation from duct (if necessary), then disconnect linkage to fold shut all fire dampers. Asbestos abatement contractor shall seal all edges and seams with caulk and duct-tape.
 2. Asbestos abatement contractor shall then cut existing duct and fold metal in and secure with approved fasteners. Asbestos abatement contractor shall caulk and duct-tape all seams and edges.

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3. All ducts shall then be completely wrapped and sealed with duct-tape and three (3) layers of reinforced polyethylene sheeting.
 4. All ducts shall be restored to original working order at the end of the project.
- D. Where present HVAC systems (ducts) service occupied areas (non-Work Areas), the Asbestos abatement contractor shall blank off the ducts.
1. To isolate or seal the return duct, the asbestos abatement contractor shall remove any insulation (if necessary) from the duct. Then disconnect linkage to fold shut all fire dampers and insert a fiberglass board within the duct. Asbestos abatement contractor shall seal all edges and seams with caulk, duct-tape and three (3) layers of reinforced polyethylene sheeting.
 2. All isolation of return ducts and any other activity that requires removal of ceiling by the asbestos abatement contractor shall be conducted under controls. Work is to be coordinated with the Construction Project Manager and the Facility and is described as follows:
 - a. Work shall occur as scheduled.
 - b. Horizontal surfaces near the blanking operations shall be protected with fire retardant 6-mil polyethylene sheeting.
 - c. Plastic drapes shall be used to enclose the immediate area.
 - d. Asbestos abatement contractor to position and operate air filtration devices and HEPA-vacuums in the area to clean space after blanking operations.
 - e. All personnel involved with this work shall receive personal protection (i.e., respirators and disposable suits).
- E. Upon loss of negative pressure or electric power, all work activities in an area shall cease immediately and shall not resume until negative pressure and/or electric power has been fully restored. When a power failure or loss of negative pressure lasts, or is expected to last, longer than thirty (30) minutes, the following sequence of events shall occur.
1. All make up air inlets shall be sealed airtight.
 2. All decontamination facilities shall be sealed airtight after evacuation of all personnel from the Work Area.
 3. All adjacent areas shall be monitored for potential fiber release upon discovery of and subsequently throughout, power failure.

3.07 LOCKOUT OF HVAC SYSTEMS, ELECTRIC POWER, AND ACTIVE BOILERS

Prior to the start of any prep work, the asbestos abatement contractor shall employ skilled tradesmen with limited asbestos licenses for the following work:

- A. Disable all ventilating systems or other systems bringing air into or exhausting air out of the Work Area. Disable system by disconnecting wires removing circuit breakers, by lockable switch or other positive means to ensure against accidental re-starting of equipment.
- B. Lock out power to the Work Area by switching off all breakers and removing them from panels or by switching and locking entire panel. Label panel with following notation: "DANGER CIRCUIT BEING WORKED ON". Give all keys to Facility.
- C. Lock out power to circuits running through Work Area whenever possible by switching off and removing breakers from panel. If circuits must remain live, the Facility shall notify asbestos abatement contractor in order that he may secure a variance from NYCDEP. The asbestos abatement contractor shall protect all conduit and wires to remain and label all active circuits at intervals not to exceed 3 feet with tags having the following notation: "DANGER LIVE ELECTROCUTION HAZARD". The asbestos abatement contractor shall label all circuits in all locations including hidden locations that may be affected by the work in a similar manner.
- D. All boilers and other equipment within the work area shall be shut down, locked out, tagged out and the burner/boiler/equipment accesses and openings shall be sealed until abatement activities are complete. If the boiler or other exhausted equipment will be subject to abatement, all breeching, stacks, columns, flues, shafts, and double-walled enclosures serving as exhausts or vents shall be segregated from the affected boiler or equipment and sealed airtight to eliminate potential chimney effects within the work area.

PART 4 – PREPARATION OF WORK AREA AND REMOVAL PROCEDURES

4.01 REMOVAL OF ASBESTOS-CONTAINING MATERIAL

- A. Asbestos abatement contractor Responsibility

Asbestos abatement contractor shall be responsible for the proper removal of ACM from the Work Area using standard industry techniques. The Third-Party Air Monitor representative shall observe the Work.

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1. General Requirements:

- a. Removal of ACM shall be performed using wet methods. Dry removal of ACM is prohibited.
- b. Spray ACM with amended water with sufficient frequency and quantity to enhance penetration. Sufficient time shall be allowed for amended water to penetrate the material to the substrate prior to removal. All ACM shall be thoroughly wetted while work is being conducted.
- c. Accumulation of standing water on the floor of the Work Area is prohibited.
- d. Apply removal encapsulants, when used, in accordance with the manufacturer's recommendations and guidelines.
- e. Containerize ACM immediately upon detachment from the substrate. Alternately, ACM may be dropped in to a flexible catch basin and promptly bagged. Detached ACM is not permitted to lie on the floor for any period of time. Excess air within the bag shall be removed before sealing. ACM shall not be dropped from a height of greater than 10 feet. Above 10 feet, dust free inclined chutes may be used. Maximum inclination from horizontal shall be 60-degrees for all chutes.
- f. Exits from the work area shall be maintained, or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.
- g. Signs clearly indicating the direction of exits shall be maintained and prominently displayed within the work area.
- h. No smoking signs shall be maintained and prominently displayed within the work place.
- i. At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.
- j. If the containment area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall

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be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors the cut off switch shall be able to turn off the equipment on all floors.

B. Removal of ACM Utilizing Full Containment Procedures shall be as follows:

1. Preparation Procedures:

- a. Ensure that the Third-Party Air Monitor has performed area monitoring and established a background count prior to the preparatory operations for each removal area, as applicable.
- b. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of fire retardant polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos-asbestos contaminated waste.
- c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.
- d. Provide and install decontamination enclosure systems in accordance with Sections 3.01 and 3.02 of this Section.
- e. Remove ACM that may be disturbed by the erection of partitions using tent procedures and wet removal methods. Removal shall be limited to a one-foot wide strip running the length/height of the partition.
- f. Pre-clean and remove moveable objects from the Work Area. Pre-cleaning shall be accomplished using HEPA-vacuum and wet-cleaning techniques. Store moveable objects at a location determined by the City.
- g. Protect carpeting that will remain in the Work Area.
 - (1) Pre-clean carpeting utilizing wet-cleaning techniques.
 - (2) Install a minimum of two layers of fire retardant 6-mil reinforced polyethylene sheeting over carpeting.
 - (3) Place a rigid flooring material, minimum thickness of 3/8-inch, over polyethylene sheeting.

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- h. Pre-clean all fixed objects to remain within the Work Area using HEPA-vacuum and wet-cleaning techniques.
- i. Seal fixed objects with two individual layers, minimum, of 6-mil fire retardant polyethylene sheeting.
- j. Pre-clean entire Work Area utilizing HEPA-vacuum and wet-cleaning techniques. Methods of cleaning that raise dust; such as dry sweeping or use of vacuum equipment not equipped with HEPA-filters, is prohibited.
- k. Install isolation barriers (i.e., sealing of all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffusers, and other penetrations within the Work Area) using two layers of 6-mil fire retardant polyethylene sheeting and duct-tape.
- l. Construct rigid framework to support Work Area barriers.
 - (1) Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist for all openings greater than 32 square feet. Framework is not required except where one dimension is one foot or less or the opening will be used as an emergency exit.
 - (2) Apply a solid construction material, minimum thickness of 3/8-inch to the Work Area side of the framing. In secure interior areas, not subject to access from the public or building occupants, an additional layer of 6-mil fire retardant polyethylene sheeting may be substituted for the rigid construction material.
 - (3) Caulk all wall, floor, ceiling, and fixture joints to form a leak tight seal.
- m. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of 6-mil fire retardant plastic and fire rated plywood, as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.
- n. Remove ceiling mounted objects not previously sealed that will interfere with removal operations. Mist object and surrounding ACM with amended water prior to removal to minimize fiber dispersal. Clean all moveable objects using HEPA-vacuum and wet-cleaning techniques prior to removal from the Work Area.

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- o. Fiberglass insulation with intact coverings shall be protected in place during abatement activities. These materials shall be protected with two layers of 6-mil fire retardant polyethylene sheeting as isolation barriers and two additional layers of 6-mil fire retardant polyethylene sheeting serving as primary and secondary surface barriers.
- p. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour within the Work Area relative to surrounding non-Work Areas. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures. The use of HEPA-filtered vacuum to produce a negative air pressure inside the enclosure is prohibited.
- q. Maintain emergency and fire exits from the Work Areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the Work Area. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- r. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- s. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.
- t. Prior to being plasticized, the Work Areas shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.
- u. Plasticize the area after pre-cleaning, using the following procedures.
 - (1) Cover floors with one layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 6 inches up wall, and seal layer to wall.

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- (2) Cover walls with one layer of 6-mil fire retardant polyethylene sheeting, overlapping wall layer a minimum of 6 inches, and seal layer to floor layer.
 - (3) Cover floors with a second layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
 - (4) Cover walls with a second layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.
 - (5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.
 - (6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM waste as described in this Specification.
 - (7) Repeat preparation of areas accessed by demolition activities as described above.
- v. Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.
- w. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.
- x. Means of egress shall not be obstructed by hardwall barriers.
- y. Pre-Removal Inspections.
- (1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Third-Party Air Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.
 - (2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.

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- (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.
2. Removal of ACM Within Full Containment:
 - a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
 - b. Remove the material using hand tools such as scrapers or putty knives. Wire-mesh or wood lathe reinforcing, when present, shall be cut into manageable pieces and disposed of as ACM.
 - c. Remove any residual material from the substrate using wet cleaning methods and nylon-bristled hand brushes.
 - d. Place the removal material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
 - e. Following the completion of removal of insulation, all visible residue shall be removed from the substrate.
3. Following Removal of ACM utilizing Full Containment Procedures:
 - a. First Cleaning:
 - (1) Remove any visible accumulation of asbestos material and debris. HEPA-vacuuming and wet cleaning shall be performed on all surfaces inside the Work Area. All sealed drums, plastic bags, and equipment used in the Work Area shall be removed from the Work Area.
 - (2) Upon request of the asbestos abatement contractor, the Third-Party Air Monitor will perform a visual inspection. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.
 - (3) Remove first layer of plastic sheathing inside the Work Area. The isolation barriers and decontamination facility shall remain in place and be utilized.
 - b. Second Cleaning:
 - (1) After the first cleaning, the Work Area shall be vacated for twelve hours to allow fibers to settle.

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- (2) All objects and surfaces in the Work Area shall be HEPA - vacuumed and wet cleaned for a second cleaning.
- (3) A thin coat of lockdown encapsulant shall be applied to all plastic covered surfaces in the Work Area.
- (4) When the encapsulant is dry, second layer of polyethylene sheeting on the walls, ceiling and floors shall be removed. Do not remove seals from doors, windows, Isolation Barriers or disconnect the negative pressure equipment.

c. Third Cleaning:

- (1) A minimum of four hours after the second cleaning, all the surfaces in the Work Area shall be HEPA-vacuumed and wet cleaned for a third cleaning.
- (2) Upon the request of the asbestos abatement contractor, the Third-Party Air Monitor will do final visual inspection for re-occupancy. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.
- (3) When the Work Area passes the Third-Party Air Monitor's visual re-occupancy inspection, air sampling shall not begin until at least one hour after the completion of the third cleaning. The Third-Party Air Monitor shall perform air monitoring using aggressive testing techniques. The Third-Party Air Monitor will approve re-occupancy if the specified fiber count in the Work Area is achieved according to the Third-Party Air Monitor.
- (4) When the Work Area passes the re-occupancy test, all controls and seals established shall be removed.
- (5) The cleaned layer of the surface barriers shall be removed from walls and floors.
- (6) The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

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d. Final Barrier Removal:

- (1) Upon receipt of acceptable clearance testing results, polyethylene sheeting and Isolation Barriers shall be removed and disposed accordingly as asbestos-containing material.
- (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.

e. The Third-Party Air Monitor will conduct a final visual observation. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization.

C. Removal of ACM utilizing NYCDEP Title 15, Chapter 1 §1-106 Tent Containment Procedures and/or Tent and Glove-bag Procedures utilizing NYDEP Title 15, Chapter 1 §1-105 shall be as follows:

1. Preparation Procedures:

- a. Ensure that the Third-Party Air Monitor has performed area monitoring and established a background count prior to the preparatory operations for each removal area, as applicable.
- b. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos-asbestos contaminated waste.
- c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.
- d. Provide and install decontamination enclosure systems in accordance with PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications. Decontamination facilities may be remote from the Work Areas.
- e. Construct rigid framework to support Work Area barriers. Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist.

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- f. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of fire retardant 6-mil plastic and minimum 3/8" fire rated plywood, as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer. Any opening greater than 32 square feet shall be framed with 2-inch by 4-inch studding placed 16 inches on center.
- g. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour and negative pressure of -0.02" of water column within the Work Area relative to surrounding non-Work Areas. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures. The use of HEPA-filtered vacuums to produce a negative air pressure inside the enclosure is prohibited.
- h. Maintain emergency and fire exits from the Work Areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the Work Area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- i. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- j. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacture equipped with HEPA filtered local exhaust ventilation.
- k. Prior to being plasticized, the Work Areas shall be cleaned using HEPA-vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.
- l. There shall be an airlock at the entrance to the tent, unless there is an attached worker or waste decontamination system.
- m. Plasticize the area after pre-cleaning, using the following procedures. Do not apply polyethylene sheeting to the wall and ceiling surfaces that will be demolished to access ACM.
 - (1) Cover floor with one layer of fire retardant 6-mil polyethylene

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sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.

- (2) Cover walls with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.
 - (3) Cover ceilings with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to wall layer.
 - (4) Repeat procedure for second layer. All joints in polyethylene sheeting shall be glued and taped in such a manner as to prohibit air passage. Joints on plastic layers shall be staggered to reduce the potential for water to penetrate.
 - (5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.
 - (6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM as described in this Specification.
 - (7) Repeat preparation of areas accessed by demolition activities as described above.
 - (8) Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.
 - (9) Protect non-ACM insulation within the Work Area(s) with two individual layers of fire retardant 6-mil polyethylene sheeting. Sheeting shall remain in-place until satisfactory clearance air monitoring results are achieved.
- n. Installation of glove-bags for removal of thermal system insulation, when required:
- (1) General: Glove-bag operations shall be performed using commercially available glove-bags of at least fire retardant 6-mil, transparent plastic appropriately sized for the diameter of the material to be removed. The use of "moveable" glove-bag techniques is strictly forbidden. At no time, shall the glove-bag be sized to allow for the removal of more than three linear feet of insulation. Glovebag procedures may only be used in

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conjunction with full containment of the work area or the tent procedure.

- (2) Place the necessary tools and materials inside of the tool pouch of the glove-bag before the glove-bag procedure begins.
 - (3) Place duct-tape securely around the affected area to form a smooth area to which the glove-bag can be securely fastened.
 - (4) Attach glove-bag to the cable, wire or pipe. Seal top of glove-bag by double folding and stapling. Place duct-tape along the seam to form an airtight seal. Seal sides of glove-bag, where cable, wire or pipe passes through, with duct-tape to form an airtight seal.
 - (5) If the material adjacent to the work section is damaged, terminates, is jointed or contains an irregularity, wrap the section in two layers of 6-mil fire retardant polyethylene sheeting and seal airtight with duct-tape.
 - (6) Smoke test each glove-bag as indicated below. The Third-Party Air Monitor shall be present during all smoke testing.
 - (7) The glovebag shall be placed under negative pressure utilizing a HEPA vacuum, and a smoke tube shall then be aspirated to direct smoke at all seams and seals from outside the glovebag. Any leaks detected by the smoke test shall be duct taped airtight.
 - (8) All necessary tools and materials shall be brought into the work area before the glovebag procedure begins.
 - (9) Glovebag procedures shall be conducted by workers specifically trained in glovebag procedures and equipped with appropriate personal protective equipment.
 - (10) The insulation diameter worked shall not exceed one half the bag working length above the attached gloves.
- o. Glovebag procedures shall be conducted by workers specifically trained in glovebag procedures and equipped with appropriate personal protective equipment.
- p. Pre-Removal Inspections
- (1) Prior to removal of any ACM, the Asbestos abatement contractor shall notify the Third-Party Air Monitor and request

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a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.

- (2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.
- (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Thermal Insulation Using Glove-Bag Techniques:

- a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
 - b. Remove the insulation using hand tools such as knives or scissors.
 - c. Exercise caution when removing insulation.
 - d. Remove any residual asbestos-containing insulation from the substrate using wet cleaning methods and nylon-bristled hand brushes.
- (1) Any insulation ends created by this procedure shall be sealed with encapsulant prior to bag removal or thoroughly wetted before bag removal and sealed with wettable cloth end caps and spray glue or any combination of these materials immediately following bag removal.
 - (2) The tool pouch shall be separated from the bag prior to disposal by twisting it and the wall to which it is attached several times, and taping the twist to hold it in place, thus sealing the bag and the pouch which are severed at the midpoint of the twist. Alternatively, the tools can be pulled through with one or both glove inserts, thus turning the gloves inside out. The glove(s) is/are then twist sealed forming a new pouch, taped and several mid-seal forming two separate bags.
 - (3) A HEPA vacuum shall be used for evacuation of the glovebag in preparation for removal of the bag from the surface for clean-up in the event of a spill, and for post project clean-up.
 - (4) With the glovebag collapsed and the ACM in the bottom of the bag, the bag shall be twisted several times and taped to seal that section during bag removal.

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- (5) A 6-mil plastic bag shall be slipped around the glovebag while it is still attached to the surface. The bag shall be detached from the surface by removing the tape or cutting the top with blunt scissors.
 - (6) The asbestos-containing waste, the clean-up materials, and protective clothing shall be wetted sufficiently, double-bagged minimizing air content, sealed separately, and disposed of in conformance with applicable regulations.
3. Removal of ACM Utilizing Tent Containment Procedure:
- a. Tent procedures shall be limited to the removal of less than 260 linear feet and 160 square feet of ACM and shall not result in disturbance of ACM during tent erection.
 - b. Mist material with amended water and/or foam. Allow sufficient time for the amended water to penetrate the material to be removed.
 - c. Cut bands, wire or other items placed over insulation or ACM.
 - d. Remove the ACM using hand tools such as knives or scrapers.
 - e. Exercise caution when removing ACM.
 - f. Remove any residual asbestos-containing material from the substrate using wet cleaning methods.
 - g. Seal exposed ends of remaining insulation or ACM with a "wetable cloth" and/or encapsulant.
 - h. Place the removed material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
 - i. Following the completion of removal of ACM, all visible residue shall be removed from the substrate.
4. Following Removal of ACM Utilizing Tent Containment or Tent/Glovebag Procedure:
- a. Clean all visible accumulations of loose ACM. Metal shovels shall not be used within the Work Area.

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- b. Accumulations of dust shall be cleaned continuously until completion of clean up.
- c. After removal of all visible accumulations of ACM, the area shall be:
 - (1) Wet cleaned using rags, mops or sponges.
 - (2) Permitted sufficient time to dry, prior to HEPA vacuuming all substrates.
 - (3) Lightly encapsulated to lockdown residual asbestos. A thin coat of an encapsulating agent shall be applied to any surfaces in the Work Area which were not the subject of removal or other remediation activities. In no event shall encapsulant be applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring results. Asbestos abatement contractor shall request and pass a visual inspection performed by the consultant before proceeding to the next step. Documentation of passing this inspection shall be recorded in a daily logbook.
 - (4) The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
 - (5) If the Work is accepted by the Third-Party Air Monitor based on the inspection, asbestos abatement contractor shall be notified. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations.
 - (a) All waste shall be removed from the Work Area and holding areas.
 - (b) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
 - (6) If the Work is not approved, the Third-Party Air Monitor will inform Asbestos abatement contractor who will then HEPA-vacuum and/or wet-clean the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
 - (7) The Work Area shall be vacated for a minimum of one hour to allow fibers to settle prior to clearance air monitoring, when required.

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d. Final Barrier Removal

- (1) Upon receipt of acceptable clearance testing results polyethylene sheeting (inside layers) and Isolation Barriers shall be removed and disposed accordingly as ACM. The tent shall be collapsed inward, enclosing the contaminated clothing. This contaminated material shall be disposed of in another plastic bag. The HEPA vacuum shall be decontaminated and sealed.
- (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA-vacuum and wet methods.

e. The Third-Party Air Monitor will conduct a final visual inspection. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.

4.02 MAINTENANCE OF CONTAINED WORK AREA AND DECONTAMINATION ENCLOSURE SYSTEMS

- A. Ensure that barriers are installed in a manner appropriate to the expected weather conditions during the project and for its duration. Repair damaged barriers and remedy defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.
- B. Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of two times for each 8-hour work shift.

PART 5 – ASBESTOS WASTE MANAGEMENT

5.01 ACM WASTE REQUIREMENTS

- A. The asbestos abatement contractor and all sub-asbestos abatement contractors are specifically alerted to the illegal practice of combining asbestos-containing waste (ACW) from one project with the ACW of other projects without using the services of a permitted waste transfer station as defined by 6 NYCRR Part 360 and 364. As part of the shop drawing submittals, the Asbestos abatement contractor must submit for approval the proposed method of transportation and disposal that will be utilized to manage the ACW of this Contract. If a permitted transfer station is to be used, the cost shall be included in the work.. The asbestos abatement contractor must submit a waste manifest consistent with whatever approved

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method is utilized as part of the invoicing and payment procedures.

- B. The asbestos abatement contractor shall maintain compliance with the strictest set of regulations of Title 15, Chapter 1 of RCNY, NYC LL 70/85, NYS DOL ICR 56, USEPA, Asbestos Regulation 40 CFR Section 61.152, 29 CFR 1926.1101, 29 CFR 1910.1200 (F) of OSHA's Hazard Communication Standards, and other applicable standards.

NOTE: Any penalties incurred for failure to comply with any of the above regulations will be the sole responsibility for fines imposed due to negligence of the Asbestos abatement contractor.

- C. When presenting ACW for storage at the generation site, the Asbestos abatement contractor shall:
1. Wet down ACW in a manner sufficient to prevent all visible emissions of dust into the air.
 2. Seal material in a leak tight container while wet.
 3. Keep ACW separate from any other waste.
- D. When presenting ACW for storage away from the site of generation, the Asbestos abatement contractor shall:
1. Ensure that ACW has been properly packaged as per requirements above.
 2. Examine the containers of ACW to ensure that there are no breaks in the containers and that no visible dust is being released into the air.
 3. If examination reveals damage to a container of ACW the Asbestos abatement contractor or person accepting the waste shall immediately wet down the ACW and repackage it into a clean leak tight container. The subsequent repackaging shall be the financial responsibility of the Asbestos abatement contractor and occur at no extra cost to the City.
 4. Keep ACW separate from any other waste.
- E. When storing ACW – The Asbestos abatement contractor shall:
1. Ensure that the ACW has been sufficiently wetted down in tight containers.
 2. Re-wet and repackage any damaged containers.
 3. Maintain at storage site an adequate supply of spare leak tight containers.
 4. Maintain at storage site an adequate supply of amended water.

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5. Keep ACW separate from any other waste.
 6. Keep ACW in a secured, enclosed, and locked container.
 7. If the Asbestos abatement contractor has intention of sorting a quantity of ACW greater than or equal to 50 cubic yards, the Asbestos abatement contractor shall:
 - a. Submit a written request and receive written approval from the City.
- F. When presenting for transport, the Asbestos abatement contractor shall:
1. Ensure that ACW has been sufficiently wetted down.
 2. Examine the integrity of the container's airtight seal.
 3. Re-wet and repackage any damaged containers.
 4. Keep ACW separate from all other waste.
 5. Ensure that a person transporting asbestos waste holds a valid permit issued pursuant to law.
 6. Frequency of Waste Removal:
 - a. Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site without written approval from the City. The Waste Hauler and landfill shall be as indicated on the notifications to regulatory agencies.
- G. Waste Load-out Through Equipment Decontamination Enclosure (Full Decontamination Facility): Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick polyethylene sheeting. Clean outer covering of asbestos waste package by wet cleaning and/or HEPA-vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the equipment washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil polyethylene sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.
1. The clean containerized items shall be moved to the equipment decontamination enclosure holding area pending load-out to storage or disposal facilities.
 2. Workers who have entered the equipment decontamination enclosure system from the uncontaminated non-Work Area shall perform load-out of

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containers from the decontamination enclosure holding area. Dress workers moving asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.

3. Thoroughly clean the equipment decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.
 4. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, including those turned "inside-out", shall be handled and disposed of as ACM waste.
- H. All asbestos materials, wastes, shower water, polyethylene, disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York Department of Environmental Conservation and New York City Department of Sanitation.
- I. All asbestos materials shall be prepared for transportation in accordance with this specification and all applicable Federal, State, County and City Regulations. asbestos abatement contractor shall submit the following documentation:
1. Where applicable, an EPA Generator's identification number which has been obtained from the EPA for all asbestos waste generated from the project.
 2. Applicable State Waste Hauler license and registration numbers.
 3. Federal Hazardous Materials Waste Hauler number.
 4. Designated landfill EPA Permit numbers.
- J. Prior to loading asbestos waste the enclosed cargo areas (dumpster) shall be prepared as follows:
1. Clean via HEPA-vacuum and wet wipe techniques the enclosed cargo areas of all visible debris prior to preparing with polyethylene.
 2. Line the cargo area with two layers of 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and extend up the walls a minimum of 24-inches. Wall sheeting shall be overlapped and taped securely into place.

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- K. Asbestos-containing waste shall be placed on level surfaces in the cargo area of the dumpster and shall be packed tightly to prevent any shifting or tipping of the waste during transportation.
- L. Asbestos-containing waste shall not be thrown into or dropped from the dumpster. All material shall be handled carefully to prevent rupture of the containers.
- M. All personnel engaged in handling and loading of asbestos contaminated waste outside of the Work Area shall wear protective clothing. The disposable clothing shall include head, body and foot protection and color of clothing shall be different from abatement personnel in the Work Area. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters.
- N. Asbestos abatement contractor shall immediately clean debris or residue observed on containers or surfaces outside of the Work Area. Cleaning shall be via HEPA equipped wet/dry vacuums only.
- O. All asbestos-containing waste shall be transported from the abatement site to the landfill by a registered Waste Hauler. When transporting ACW:
 - 1. Ensure that the ACW has been sufficiently wetted down in a leak tight container.
 - 2. Re-wet and repackage any damaged containers.
 - 3. Maintain at storage site an adequate supply of spare leak tight containers.
 - 4. Maintain at storage site an adequate supply of amended water.
 - 5. Keep ACW separate from any other waste.
- P. Keep ACW in a secured, enclosed, and locked container.
- Q. Waste transport documents shall conform to the requirements of the U.S. Department of Transportation, Hazardous Materials Transportation Regulation, 49 CFR Part 173 and EPA 40 CFR 61.150 (d)(1)(2). Shipping documents shall be clearly marked with the required designation "RQ Asbestos". Asbestos abatement contractor shall provide a copy of this document to the City.
- R. A uniform hazardous waste manifest shall be prepared by the asbestos abatement contractor and signed by the asbestos abatement contractor each time the asbestos abatement contractor ships a dumpster load of Asbestos-Containing Waste Material. The uniform hazardous waste manifest shall include the site of waste generation, the names and addresses of the Transporter, the asbestos abatement contractor, and the landfill operator with information on the type and number of asbestos-waste containers, time and date. Asbestos abatement contractor shall provide the Construction Project Manager, Third-Party Air Monitor or authorized

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designated representative with signed copies of the waste manifest before each departure.

- S. Asbestos abatement contractor or his registered hazardous Waste Hauler shall transport asbestos-containing waste material from the abatement site directly to the specified disposal site. Asbestos abatement contractor or their Waste Hauler shall not accept material from any other site when transporting asbestos-containing waste material from the abatement site. The authorized DDC representative or Construction Project Manager reserves the right to travel with asbestos abatement contractor's Waste Hauler to the waste disposal site. No intermediate storage of waste material (i.e., asbestos abatement contractor's warehouse) shall be permitted.
- T. Final or progress application for payments will not be processed unless all hazardous waste manifests generated to date have been received and reviewed by the Construction Project Manager.
- U. All asbestos materials, wastes, shower water, polyethylene disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York State Department of Environmental Conservation and the New York Department of Sanitation.
- V. Asbestos abatement contractor shall transport all sealed drums to a landfill disposal site approved by the Department of Environmental Conservation and the EPA. Transportation shall be performed by a New York State registered Waste Hauler, where required. When presenting the ACW for disposal the Asbestos abatement contractor or sub Asbestos abatement contractor shall:
 - 1. Ensure that waste container is properly labeled according to the National Emission Standard for Hazardous Air Pollutants (NESHAP); Asbestos Revision, 40 CFR, Part 61, Subpart M. The labels shall include the name of the waste generator and the location where the waste was generated.
 - 2. Comply with all applicable orders issued pursuant to asbestos disposal.
 - 3. Ensure that ACW has been sufficiently wetted down.
 - 4. Re-wet and repackage any damaged containers.
 - 5. Keep ACW separate from all other wastes.
- W. Asbestos abatement contractor shall notify the waste disposal site, at least 24 hours prior to transportation of asbestos contaminated waste to be delivered. Asbestos abatement contractor shall determine if a larger notification period is required.
- X. At the site asbestos abatement contractors or Waste Hauler trucks shall approach the dump location as close as possible for unloading asbestos waste. Containers

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shall be carefully placed in the ground. Do not throw containers from truck.

- Y. Asbestos abatement contractor or Waste Hauler shall inspect containers as they are unloaded at the disposal site. Material in damaged containers shall be repacked in empty containers, as necessary.
- Z. Asbestos abatement contractor or Waste Hauler shall not remove asbestos-containing waste Material from drums unless required to do so by the disposal site City. Used drums shall be disposed of as asbestos-asbestos contaminated waste.
- AA. All personnel engaged in unloading of the containers at the waste site shall wear protective clothing. The disposable clothing shall include head, body and foot protection. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters. Workers shall remove their protective clothing at the disposal site, place it in labeled disposal bags and leave them with the deposited waste shipment.
- BB. For the compaction operation, the asbestos abatement contractor shall ensure that disposal sites personnel have been provided with personal protective equipment by the disposal operator. If the disposal site City has not provided this protective equipment, the asbestos abatement contractor shall supply protective clothing and respiratory protection for the duration of this operation (PAPR respirators are mandatory).
- CC. If containers are broken or damaged, the asbestos abatement contractor or Waste Hauler shall, using personnel who are properly trained and wearing proper protective equipment, shall repackage the waste in properly labeled containers. Asbestos abatement contractor shall then clean the entire truck and its contents using HEPA-vacuums and wet cleaning techniques until no visible residue is observed.
- DD. Following the removal of all containerized waste, the asbestos abatement contractor shall decontaminate the truck cargo area using HEPA-vacuums and/or wet cleaning techniques until no residue is observed. All 6-mil polyethylene sheeting shall be removed and discarded as asbestos-containing waste material along with contaminated cleaning material and protective clothing, in containers at the disposal site.
- EE. The transporter(s) of all asbestos waste shall not back-haul any items on his return from landfill/disposal site.
- FF. All asbestos waste shall be disposed of in an approved Asbestos Landfill site only.
 - 1. NO PERSON UNDER ANY CIRCUMSTANCES SHALL ABANDON ACW. The same shall be disposed of only by certified persons in approved landfills.

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2. A manifest form will be signed by the Landfill documenting receipt and acceptance of the asbestos-containing waste. This manifest will be furnished to the City of New York within thirty calendar days from the project completion date.
3. It is the responsibility of the Asbestos Asbestos abatement contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The Asbestos Asbestos abatement contractor must comply fully with these regulations and all appropriate U.S. Department of Transportation, EPA and other Federal, State and Local entities' regulations and all other current legal requirements.
4. The asbestos abatement contractor shall obtain an agreement from the transporter (s) that the practice of "Back-Hauling" will not be engaged in, with respect to any and all waste loads taken from this site during the work.
5. The asbestos abatement contractor will document actual disposal of the waste at the designated landfill by having completed a Disposal Certificate and will provide a copy of the same to the Department of Design and Construction.

PART 6 – ACCEPTANCE

6.01 ACCEPTANCE

Upon satisfactory completion of all decontamination procedures, a certificate will be issued by the Construction Project Manager with copies to all parties.

- A. A letter of Compliance stating that all the work on the project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations.
- B. All warranties as stated in the Specifications.

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SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, equipment and services, and perform operations required for installation of Concrete and related work as indicated on the drawings and specified herein. See architecturally exposed concrete section for additional and supplementary requirements.
- B. Work Included: The work of this section shall include, but not be limited to, the following:
 - 1. Concrete formwork.
 - 2. Cast-in-place concrete.
 - 3. Concrete reinforcement and accessories.
 - 4. Finishing concrete.
 - 5. Installation of anchors, sleeves, inserts, slots and the like prior to placement of concrete as required by other trades or for the support of their work.
- C. Related Work Specified Elsewhere:
 - 1. Concrete Testing and Inspection
 - 2. Architectural Cast-in-Place Concrete
 - 3. Structural Steel
 - 4. Metal Decks
 - 5. Miscellaneous Metal
 - 6. Steel Stairs
 - 7. Waterproofing
 - 8. Insulation
 - 9. Sealants and Caulking

1.2 QUALITY ASSURANCE

- A. Materials and work shall conform to the latest edition of reference specifications listed below and specified herein, required fire ratings and to applicable codes and requirements of local authorities having jurisdiction:
 - 1. The following specifications, codes and publications of the issues listed below, and later referred to by basic designation only, form a part of this specification to the extent indicated:
 - a. American Concrete Institute - Latest Edition:
 - 1) ACI 211.1 - Recommended Practice for Selecting Proportions for Normal Concrete.
 - 2) ACI 211.2 - Recommended Practice for Selecting Proportions for Structural Lightweight Concrete.
 - 3) ACI 301 - Specifications for Structural Concrete for Buildings.
 - 4) ACI 302 - Guide for Concrete Floor and Construction.
 - 5) ACI 304 - Recommended Practice for Measuring, Mixing and Placing Concrete.
 - 6) ACI 305 - Hot Weather Concreting.

- 7) ACI 306 - Cold Weather Concreting.
 - 8) ACI 308 - Recommended Practice for Curing Concrete.
 - 9) ACI 309 - Recommended Practice for Consolidation of Concrete.
 - 10) ACI 315 - Details and Detailing of Concrete Reinforcement.
 - 11) ACI 318 - Building Code Requirements for Reinforced Concrete.
 - 12) ACI 347 - Recommended Practice for Concrete Formwork.
- b. Concrete Reinforcing Steel Institute - Latest Edition Recommended Practice for Placing Reinforcing Bars:
- 1) Reinforcing Bar Splices.
- c. Specifications of the American Society for Testing and Materials (ASTM):
- 1) A82 - Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement.
 - 2) A185 - Specifications for Welded Steel Wire Fabric for Concrete Reinforcement.
 - 3) A615 - Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement
 - 4) C31 - Standard Method of Making and Curing Concrete Test Specimens in the Field.
 - 5) C33 - Specifications for Concrete Aggregates.
 - 6) C39 - Standard Method of Testing for Compressive Strength of Cylindrical Concrete Specimens.
 - 7) C94 - Specifications for Ready-Mixed Concrete.
 - 8) C138 - Unit Weight, Yield and Air Content (Gravimetric) of Concrete.
 - 9) C143 - Slump of Portland Cement Concrete.
 - 10) C150 - Portland Cement.
 - 11) C172 - Sampling Fresh Concrete.
 - 12) C260 - Air-Entraining Admixtures for Concrete.
 - 13) C989 - Slag Cement
 - 13) C309 - Liquid Membrane - Forming Compounds for Curing Concrete.
 - 14) C330 - Lightweight Aggregates for Structural Concrete.
 - 15) C404 - Aggregates for Masonry Grout.
 - 16) C494 - Chemical Admixtures for Concrete.
 - 17) D1752 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- d. Code for Welding in Building Construction of the American Welding Society (AWS D 1.1-75).
- e. Building Code of the City of New York.
- B. Allowable Tolerances: Formwork shall comply with tolerances listed in Section 203.1 of ACI 347. See architecturally exposed concrete specification for additional requirements.
- C. Special Engineering Services:
1. Shores and reshores bracing etc. shall be designed by a licensed professional engineer retained by the Contractor.
- D. Rejections: If laboratory tests on cylinders disclose a failure to develop specified strengths, the Architect may order other tests made on affected structure. Tests shall be paid for by the Contractor. If these tests indicate that affected structure cannot safely support the design load, costs of any changes, modifications or replacements required by the Architect to remedy area in question shall be paid for by the Contractor.

1.3 SUBMITTALS

- A. Product Data: Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are delivered to the site.
- B. Shop Drawings: Submit shop drawings for the work of this section to the Architect for approval, and obtain approval prior to fabrication of materials:
 - 1. Shop drawings shall show location of work in the project, elevations, profiles and sections. Indicate materials, sizes, shapes and thicknesses; sizes and location of reinforcement and anchors; locations of items required by work of other trades.
 - 2. Prepare clear, precise drawings, drawn to scale of 1/8 inch equals 1 foot or larger, showing location and details of reinforcement including accessories necessary to hold reinforcement in its proper position. Shop drawings for structural review shall consist of (2) sets of prints and (1) set of reproducibles. Only (1) marked up set of reproducibles with the structural engineer's comments will be returned to the contractor.
 - 3. Detail reinforcement as per ACI 315.
 - 4. Architect's and Engineer's review is for general compliance with structural concept. Contractor is responsible for number and length of reinforcing.
- C. Concrete Design Mix:
 - 1. The intent to use high early strength concrete (Type I cement plus noncorrosive accelerator or Type III cement) shall be submitted to the Architect for approval prior to submission of preliminary design mixes. For color and material mix specification refer to section 033300 – Architectural Cast In Place Concrete.
 - 2. Selection of Concrete Proportions:
 - a. Assume full responsibility for design of concrete mixes and maintaining strength and consistency of concrete to be used on this project. Select and employ a reputable Testing Laboratory to assure finished concrete will conform with Specifications. Testing Laboratory's name shall be submitted to the Architect for approval prior to start of work. Services of Laboratory shall be paid for by the Contractor and shall be included in bid price.
 - b. Furnish an affidavit to the Architect attesting that the material samples submitted to the Laboratory are representative of the materials to be furnished for concrete on this project.
 - c. Submit to the Architect, with a written indication of Contractor's acceptance, three (3) copies of proposed design mix including standard deviation analysis or trial batch test data with required curves, sieve analysis of aggregate and other required tests. Submit proposed mix designs and 28 day test results to the Architect at least 10 days before initial placement of concrete takes place.
 - d. The Architect's review of Laboratory's report and data shall not relieve Contractor from his responsibility for supplying and installing concrete in accordance with these specifications.
 - e. Site and batch plant inspection during the course of construction will be done by a Testing Laboratory retained by the Contractor. Cooperate with Testing Laboratory throughout the work, including handling of test cylinders.
 - f. Certification: Written conformance to above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered to the site in original unopened containers, clearly indicating manufacturer's name, brand name, and other identifying information.
- B. Protect and store materials in accordance with ACI 301 - Section 2.5.
- C. Store materials in a dry location, off the ground, and in such a manner as to prevent damage or intrusion of foreign matter. Replace damaged materials and equipment at no expense to Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150 and shall be of domestic manufacture conforming to the following:
 - 1. Cement for General Use: Type I.
 - 2. Cement for High Early Strength: Type III or Type I plus non-corrosive accelerator.
- B. Aggregates for Normal Weight Concrete: ACI 301, Sections 2.4.1, 2.4.3 and Section 3.6, Paragraph (a) Maximum Size Coarse Aggregate. Size of aggregates:
 - 1. Structural Concrete: 3/4 inch to No. 4.
 - 2. Roof and Floor Fill: 1/2 inch to 0.
- C. Aggregates for Lightweight Concrete: ASTM C330, except that only expanded shale, clay, slag or slate, produced by rotary kiln process shall be used. Aggregates shall be prewet in accordance with manufacturer's recommendations. The following lightweight aggregates are approved:
 - 1. Norlite
 - 2. Solite
- D. Air Entraining Admixtures: Shall conform to ASTM C260 and shall be one of the following types:
 - 1. "Air Mix" - The Euclid Chemical Co.
 - 2. "MB-VR" - Master Builders brand of BASF Admixtures, Inc.
 - 3. "Darex AEA" - Grace Construction Products, W.R. Grace & Co.
 - 4. "Sika AER" - Sika Group
- E. Admixtures: Shall conform to ASTM C494 and contain not more than 0.05 percent chloride ions:
 - 1. Water Reducing Admixture:
 - a. "Eucon WR-75 by Euclid Chemical Co.
 - b. "Pozzolite 200N" by Master Builders brand of BASF Admixtures, Inc.
 - c. "Plasto Crete 160" by Sika Group
 - d. "WRDA Hycol" by W.R. Grace & Co.
 - 2. Water Reducing Retarding Admixture:

- a. "Eucon Retarder 75" by Euclid Chemical Co.
 - b. "Pozzolith 100XR" by Master Builders brand of BASF Admixtures, Inc.
 - c. "Plastiment" by Sika Group
 - d. "Darataro" by W.R. Grace & Co.
 3. High Range Water Reducing Admixture (Super Plasticizer):
 - a. "Eucon 37" by Euclid Chemical Co.
 - b. "WRDA 19" or "Daracem" by W.R. Grace & Co.
 - c. "Sikament" by Sika Group
 - d. "Rheo Build" by Master Builders brand of BASF Admixtures, Inc.
 4. Non-corrosive, Non-chloride Accelerator: The admixture manufacturer shall have long term non-corrosive test data from an independent testing laboratory using an acceptable accelerated corrosion test method (electrical potential measures):
 - a. "Accelguard 80" by The Euclid Chemical Co.
 - b. "Pozzolith High Early" by Master Builders brand of BASF Admixtures, Inc.
 - c. "Daraset" by W.R. Grace & Co.
 5. Corrosion inhibiting admixture:
 - a. "Eucon CIA" by Euclid Chemical Co.
 6. Prohibited Admixtures: Calcium chloride, thiocyanates, or any admixture containing more than 0.05 percent chloride items.
 7. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.
- F. Bar Reinforcement: ASTM A615 - Grade 60
- G. Wire Mesh: ASTM A82 and A185.
- H. Epoxy Coated Bars: ASTM A775.
- I. Fibrous Reinforcement: Collated, fibrillated polypropylene fibers for secondary reinforcement of concrete slab:
1. "Fiber Mesh" by Fibermesh Inc.
 2. "Forta CR" by Forta Corp.
- J. Slag Cement: ASTM C989
- K. Reinforced Paper (two ply with asphaltic adhesion) - Approved Manufacturers:
1. "Sisalkraft SK10" by St. Regis Laminated and Coated Products Div., St. Regis Paper Company
 2. "Grade A" by Glas Kraft, Inc.
 3. "Tuff-Champ" by Ludlow Corp.
- L. Curing Compounds:
1. Curing and Sealing Compound: The compound shall be a clear styrene acrylate type, 30 percent solids content minimum, and have test data from an independent laboratory

indicating a maximum moisture loss of 0.030 grams per square cm. when applied at a coverage rate of 300 square feet per gallon. Compound shall be one of the following types:

- a. "Super Rez Seal" or "Super Pliocure" by Euclid Chemical Co.
 - b. "Masterkore" by Master Builders brand of BASF Admixtures, Inc.
2. Dissipating Resin Curing Compound: The compound shall be dissipating resin type compound conforming to ASTM C309, Type I. The film must chemically break down in a two to four week period after application:
 - a. "Kurez DR" by Euclid Chemical Co.
 - b. "Sika Gard - Cure Hard" by Sika Group
 3. Clear Non-Yellowing Curing and Sealing Compound: Compound shall be a clear non-yellowing, high solids compound and have test data from an independent testing laboratory indicating a minimum of 500 hours under ultraviolet exposure without yellowing:
 - a. "Super Diamond Clear" by Euclid Chemical Co.
 - b. "Clear Seal" by AC Horn
- M. Vapor Barrier: See architectural and other drawings for geotextile fabric, vapor barrier and gravel requirements.
- N. Expansion Joint Filler: ASTM D1752 Type 1.
- O. Premolded Plastic Water Stops:
1. Minimum of 6 inches wide and 3/16 inch thick. Material shall be compounded from new polyvinyl chloride. No re-used material will be permitted. Water stop shall consist of hollow center bulb or "V" with flanges of equal width on either side. Flanges, for at least three-quarters their width, shall have a series of parallel projections top and bottom, spaced approximately 1/4 inch apart.
 2. Approved Manufacturers:
 - a. Afco Products, Inc.
 - b. W.R. Meadows, Inc.
 - c. Progress Unlimited, Inc.
- P. Bentonite Waterstops:
1. Bentonite Waterstops: Extruded 25% butyl rubber and 75% sodium bentonite in formed strips, series RX-101 and RX-102 waterstops by CETCO or equal.
- Q. Butyl Joint Filler :
1. Impregnated with bentonite which, upon hydration, develops a controlled swell to form a compression seal.
 2. "Waterstop RX" by American Colloid Co.
- R. Non-Shrink Grout: The grout shall conform to CRD-C-621-80, "Corps of Engineers Specifications for Non-Shrink Grout", grout shall be one of the following types:
1. "Firmix" (metallic) or "Euco NS" (non-metallic) by the Euclid Chemical Company.

2. "Ferrolith GDS" (metallic) or "Sonogrout" (non-metallic) by Sonneborn.
 3. "Embeco 153" (metallic) or "Masterflow 713" (non-metallic) by Master Builders brand of BASF Admixtures, Inc.
 4. "Vibrofoil" (metallic) or "Homgrout" (non-metallic) by A.C. Horn.
- S. Bonding Compound: The compound shall be a polyvinyl acetate, rewettable type, by one of the following:
1. "Euco-Weld" by the Euclid Chemical Co.
 2. "Weldcrete" by The Larsen Company.
- T. Epoxy Adhesive: The compound shall be a two (2) component, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces as manufactured by one of the following:
1. "Euco Epoxy #463 or #615" by the Euclid Chemical Co.
 2. "Thiopoxy" by W.R. Grace & Co.
 3. "Sikadur Hi-Mod" by Sika Group
- U. Patching Mortar: Shall be as manufactured by one of the following:
1. "Euco Thin Coat" by the Euclid Chemical Co.
 2. "Sikatop 121" by Sika Group
- V. Galvanized Soffit Clips and Haunch Stiffeners: Rigid "reed" type clips with continuous longitudinal wires and haunch stiffeners:
1. Approved Manufacturers:
 - a. Hohmann & Barnard Inc.
 - b. RKL Building Specialties Co. Inc.
 - c. Sylgab Steel & Wire Corp.
- W. Form Material:
1. For Exposed Concrete Surfaces: See architectural cast-in-place concrete section. See architectural drawings for location and extent of architecturally exposed concrete.
 2. For Unexposed Concrete Work: Forms may be rough unplanned No. 2 common lumber. Areas concealed by hung ceilings, ductwork, etc., are not to be included in this category and the formwork for these areas shall be constructed as specified for exposed areas.
 3. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 4. Form Ties: Each tie shall have a minimum working strength of 3,000 pounds.
- X. Wearing Surface Treatments:
1. Sealer/Dustproofing (Surface Film Treatment):
 - a. "Eucothane P" by The Euclid Chemical Co.
 - b. "Esco Method" by Preservative Products Co.
 2. Floor Dustproofing (Penetrating Treatment):
 - a. "Eucosill" by The Euclid Chemical Co.
 - b. "Saniseal No. 10" by Master Builders brand of BASF Admixtures, Inc.

- c. "Hornolith" by W.R. Grace & Co.
 - d. "Lapidolith" by Sonneborn
 - 3. Metallic Floor Hardener:
 - a. "Masterplate 200" by Master Builders brand of BASF Admixtures, Inc.
 - b. "Euco-Plate HD" by The Euclid Chemical Co.
 - 4. Non-Metallic Floor Hardener:
 - a. "Colorcron" by Master Builders brand of BASF Admixtures, Inc.
 - b. "Surflex" by The Euclid Chemical Co.
 - Y. Epoxy Joint Filler: In construction and contraction joints in exposed surface slabs on grade, the epoxy joint filler shall be a three (3) component, 100 percent solids compound with a minimum shore D hardness of 50:
 - 1. "Euco Epoxy 700" by The Euclid Chemical Co.
 - 2. "Sikadur Lo Mod Mortar" by Sika Group
 - Z. Epoxy Bonding Agents for Topping Slabs: ASTM C881 and ACI 503; a two (2) component, 100 percent solids, 100 percent reactive, moisture insensitive compound suitable for use on dry or damp surfaces. Provide viscosity grades and pot life best suited for intended use. Provide epoxy resin adhesive as manufactured by one of the following:
 - 1. "Euco 462 Epoxy System" or "Eucopoxy LPL" by the Euclid Chemical Co.
 - 2. "Sikadur 35, Hi-Mod" or "Sikadur 32, Hi-Mod LPL" by Sika Group
- 2.2 MIXES AND MIXING
- A. Concrete shall be produced in a plant equipped with automatic batching and recording devices for ingredients and acceptable to the Architect.
 - B. The producer shall submit evidence of the uniformity of his concrete, as determined by the coefficient of variation established for his plant by a recognized agency.
 - C. Measure and mix concrete in accordance with ACI 304, except as modified herein:
 - 1. For ready-mix concrete, Sections 1 through 10 of ASTM C94 shall apply.
 - 2. Retempering will not be allowed.
- 2.3 DESIGN MIX
- A. Design mix shall be proportioned and tested by an approved qualified Testing Laboratory as per Section 27-605 (C26-1004.3(a)) of the New York City Building Code.
 - B. For color and material mix specification refer to section 033300 – Architectural Cast In Place Concrete.
 - C. Admixtures or additives shall not be used to lower freezing point of concrete.
 - D. Admixtures:
 - 1. Concrete shall contain a water reducing admixture.
 - 2. Concrete slabs contain a non-corrosive, non-chloride accelerator.

3. Use air-entraining agent in normal weight (145 pcf) concrete that will be exposed to freezing and thawing cycles. Total calculated air content shall conform to table 4.2.1 of ACI 318 with volume determined by direct measurement (or by ASTM C138).
4. Use air-entraining agent in lightweight concrete. Total calculated air content of concrete shall be 6 percent, plus or minus 2 percent, of volume of concrete as determined by direct measurement or by ASTM C138.
5. Where hardener is used maximum air content shall be 3 percent.
6. Retarding and/or accelerating admixture may be used for cold or hot weather concreting.
7. Approved corrosion inhibitor.

E. Water-Cement Ratio:

1. Concrete subjected to freezing and thawing shall have a maximum water-cement ratio of 0.45.
2. Concrete subjected to de-icers and/or required to be watertight shall have a maximum water-cement ratio of 0.45.
3. Reinforced concrete subject to brackish water or salt spray shall have a maximum water-cement ratio of 0.40.

F. Normal Weight Concrete:

1. Concrete shall weigh approximately 145 pounds per cubic foot dry.
2. Concrete shall have a minimum compressive strength at 28 days per the concrete schedule and notes on the drawings, as determined by breaking cylinders in accordance with current requirements of ASTM C31 and C39.

G. Lightweight Concrete:

1. Lightweight concrete shall be a mixture of Portland cement, sand, coarse lightweight aggregate specified admixtures and water, designed to produce concrete not exceeding 110 pounds per cubic foot dry.
2. Concrete shall have a minimum compressive strength at 28 days per the concrete schedule and notes on the drawings, as determined by breaking cylinders in accordance with ASTM C31 and C39.
3. Lightweight aggregate shall be approved by the Board of Standards and Appeals for use in the City of New York and mix shall be proportioned in accordance with the requirements of the appropriate calendar number.

H. Pre-Concrete Conference:

1. At least 30 days prior to submittal of the concrete design mixes, convene a meeting to review the detailed requirements for concrete design mixes and determine the procedures for producing proper concrete construction.
2. Responsible representatives of every party who is concerned with the concrete work shall attend the conference, including but not limited to the following:
 - a. Contractor's superintendent.
 - b. Laboratory responsible for the concrete design mix.
 - c. Laboratory responsible for field quality control.
 - d. Concrete subcontractor.
 - e. Ready-mix concrete producer.
 - f. Admixture manufacturer(s).
 - g. Concrete pumping equipment manufacturer.

3. Record and print minutes of the meeting and distribute to parties concerned within 5 days of the meeting. One copy of the minutes shall also be transmitted to the following for information purposes:
 - a. Owner's representative.
 - b. Architect.
 - c. Consultant engineer.
4. The minutes shall include a statement by the admixture manufacturer(s) indicating that the proposed mix design and placing techniques can produce the concrete quality required by these specifications.
5. Notify the Consultant Engineer at least 10 days prior to the scheduled date of the conference.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.2 PREPARATION

- A. Examine the Contract Drawings and Specifications to insure the completeness of the work required under this Section. Supplementary work necessary to complete concrete, though not specifically indicated on Drawings or specified herein, shall be provided.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, with particular attention given to the installation of items embedded in concrete so as not to delay job progress.

3.3 FORMWORK

- A. Construction:
 1. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until concrete members and structures are of correct size, shape, alignment, elevation and position. Structural stability and efficiency of formwork is Contractor's responsibility.
 2. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces.
 3. Construct forms to sizes, shapes and dimensions shown, and to obtain accurate, level and plumbness in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, rustications, reglets, chamfers, blocking, anchorages, inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
 4. Fabricate forms for easy removal. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets and recesses to prevent swelling and for easy removal.
 5. Build formwork for exposed concrete ceilings, columns and walls of 4 by 8 feet plywood sheets arranged in a uniform pattern unless otherwise indicated. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on

drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

6. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
 7. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
 8. Where base is to be installed, chamfer on piers, pilasters and columns shall taper off at 45 degrees and stop 1/2 inch above base.
 9. Coat forms with approved non-staining coating.
 10. Form Ties: Where concrete is exposed, ties shall be of snap-tie type so that when forms are removed and ties are broken no metal shall be closer than 1 inch from finished surface of concrete. Do not use lugs, cones or washers on ties which leave holes in concrete surface larger than 1 inch diameter.
 11. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
 12. Cleaning and Tightening: Thoroughly clean forms and adjacent surface to receive concrete. Remove chips, wood, sawdust, dirt or other debris before concrete is placed. Retighten forms and bracing after concrete placement to eliminate mortar leaks and maintain proper alignment.
 13. Design and construction of formwork shall be governed by Section 27-1035 (C26-1904.3) and other applicable sections of the New York City Building Code.
- B. Removal: Structural Concrete - Removal of forms shall conform to ACI 347 and Section 27-1035 of the New York City Building Code.
- C. Camber:
1. The Contractor shall provide a level floor within contract specified tolerances.
 2. Periodic level readings shall be supplied to the Architect and adjustments to camber made on subsequent floors as necessary based on such readings.
 3. Where camber is indicated (or for subsequent floors found required by field measurement or observations) raise bottom forms and slope gradually. Thickness of construction shall not be reduced.

3.4 REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and support.
- B. Welding of reinforcing bars shall be as specified under applicable standards of the American Welding Society (AWS).
- C. Clean reinforcement of loose rust and mill scale, earth ice, and other materials which reduce or destroy bond with concrete.
- D. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
- E. Place reinforcement to obtain minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete

placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

- F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- G. Where underside of concrete slabs and surfaces of beams and girders are exposed, bolsters, chairs, spacers and other accessories resting on formwork shall be of stainless steel or have plastic legs. Submit samples for approval.
- H. Reinforcement shall be approved in its assigned position, before concrete placement, by the controlled inspector.

3.5 CONCRETE ACCESSORIES

- A. Expansion Joint Filler: Thickness of filler shall exceed joint width by at least 25 percent and shall fill joint. Where sealing compound is required, install filler up to depth required for the compound used.
- B. Water Stops:
 - 1. Install and splice water stops in accordance with recommendations of manufacturer. Manufacturer shall have field representative available to visit site and instruct Contractor in proper methods of splicing and installing material.
 - 2. Water stop joints shall be made continuous by butt splicing to provide an impervious connection. Joints shall be made at recommended temperature, with proper tools manufactured for working with material. At each joint, ribs and other details of the water stop shall be restored so joint is identical to approved extruded pattern.

3.6 CONCRETE

- A. Placement:
 - 1. Place concrete in accordance with ACI 304, except as modified herein.
 - 2. Place concrete continuously for each piece of work. When interruptions are necessary, leave concrete in an uneven rough condition or provide construction joint. Before starting new work, where no construction joint is provided, roughen concrete surfaces with a chipping pick, wash thoroughly and apply a bonding compound. Place new concrete after bonding compound has dried.
 - 3. Do not deposit concrete from a height exceeding six (6) feet, or 10 feet when using concrete containing the high range water reducing admixture (superplasticizer), unless elephant trunks are used. Do not move concrete horizontally in the forms more than three (3) feet from point of deposit.
 - 4. Place concrete for walls over 6 feet high continuously between vertical construction joints. Build forms for full height of wall and provide casting holes when elephant trunks are not used. Concrete shall not be dropped further than indicated in the preceding paragraph. Care shall be taken so that concrete does not segregate during the placing operations.
 - 5. Limit continuous concrete placement for walls to forty (40) lineal feet. Walls longer than forty (40) lineal feet may be placed in two (2) or more sections but sections of the same day's concrete shall not be in contact with each other.
- B. Pumping Concrete:

1. The intent to place concrete by pumping shall be indicated in writing and the proposed design mix as well as method of pumping shall be submitted to the Architect for approval before any pumping will be permitted. The pump must be suitable for pumping concrete at a maximum slump of 8 inches with the high range water reducing admixture (superplasticizer). The pumping of concrete shall not relieve the Contractor from following the requirements specified under Mixing and Placement. The design mix, as previously specified, shall have a slump (at nozzle) not in excess of that herein specified for normally placed concrete. Grout, used to lubricate piping prior to pumping, shall not be placed in the project without prior approval of the Architect. Water used to clean out pipes shall not be allowed to run into forms or come in contact with freshly placed concrete. Pumped concrete may contain the specified high range water reducing admixture (superplasticizer). The approved design mix shall not be modified without the Architect's approval.
 2. Pumping shall be done only with equipment that is in good working condition and by methods which are considered good practice. Excessive stoppages due to breakdown of equipment or plugged lines, or the need to frequently adjust mix water, will be considered just causes for the Architect to direct that the pumping be stopped and other methods of placement be used.
 3. The use of aluminum pipes for conveying pumped concrete is prohibited.
 4. Pumping shall conform to ACI 304 (Chapter 9).
- C. Concrete Delivery: When concrete is delivered, provide Owner's representative with a copy of each delivery ticket showing:
1. Source of concrete (name of batch plant).
 2. Cubic yards of concrete delivered.
 3. Pounds of cement per cubic yard.
 4. Weights of cement, sand and stone/gravel per truckload.
 5. Gallons of water to be added.
 6. Admixtures and amount of same.
 7. Time and date of delivery, and time of first mixing, truck numbers and job inspector's name.
- D. Slump:
1. Slump shall conform to ACI 301 - paragraph 3.5. Consistency of any mix shall be that required for specific placing conditions and methods of placement. Use and type of vibrators used to consolidate the concrete shall conform to ACI 309, "Recommended Practice for Consolidation of Concrete". Do not use additional water to compensate for slump loss due to warm weather or delays in delivery. Obtain increased slump, if necessary, with the use of the HRWR admixture (superplasticizer).
 2. For lightweight concrete, the maximum slump shall be 3 inches unless high range water reducing admixture is used. Use care when vibrating so as not to reduce air content below that specified.
 3. Where hardener is to be used, maximum slump shall be 4 inches.
- E. Footings:
1. Immediately prior to placing concrete, the bearing surface at bottom of excavation must be given final approval by the controlled inspector or local authority having jurisdiction.
- F. Interior Slabs on Grade:
1. See architectural and other drawings for underslab requirements.
- G. Floor and Roof Slabs:

1. Provide construction joints if placement must be temporarily suspended.
 2. Provide necessary holes in floor for pipes, conduits, vent shafts and other similar items. Place wire mesh over imbedded items which are not positioned underneath top slab reinforcement, as follows:
 - a. Underfloor Ducts or Banks: When top surface is within 2 inches of top of structural slab.
 - b. Single or Double Banks: When top surface is of conduit within 1 inch of top of structural slab.
 3. Wire mesh shall be 2 inches by 2 inches by No. 16 gauge and shall extend 6 inches each side of duct or conduit.
- H. Concrete Fireproofing: (See architectural drawings if required.)
- I. Curing and Protection:
1. Take precautions to assure proper curing and protection of concrete. Protect concrete from the sun and wind. Keep concrete continuously moist and above 50 degrees F for a period of 7 days. If high early strength concrete is used, this temperature requirement may be reduced to 3 days. Start curing as soon as possible without marring finished surfaces and do not hold over until next day. If necessary, perform overtime or night work to maintain continuity between finishing and curing operations during initial period.
 2. Use the following methods to protect concrete against loss of moisture or rapid drying:
 - a. Water Curing:
 - 1) Cover with burlap or quilted mats kept continuously wet or cover with approved reinforced paper as herein specified, with side and ends lapped at least 3 inches. Seal joints and edges with tape. Keep concrete wet during curing period by admitting water through "windows" provided at laps. Keep material in good condition during curing period. Do not cement material to floor.
 - 2) When, in the Architect's opinion, favorable atmospheric conditions relating to air temperature, wind and humidity prevail, the use of water as a curing medium may be discontinued.
 - b. Curing Compounds:
 - 1) Apply material by power spray. Maximum coverage for the curing and sealing compound shall be 400 square feet/gallon on steel-troweled surfaces and 300 square feet/gallon on floated or broomed surfaces. Maximum coverage for the dissipating resin compound shall be 300 square feet/gallon on steel-troweled surfaces and 300 square feet/gallon on floated or broomed surfaces. Respray surfaces subjected to heavy rainfall within 3 hours after application. Keep coated area free for foot or vehicular traffic and construction operation for a period of seven (7) days.
 - 2) When, in the Architect's opinion, unfavorable atmospheric conditions relating to air temperature, wind and humidity prevail, the use of a continuous moisture curing method may be required for the first 24 hours for the above mentioned surfaces prior to the application.
 - c. Compatibility: Curing compound cannot be used on any slab that is to receive an applied floor covering (tile), paint or any applied material unless the compound is

compatible with the applied material or finish. Contractor shall submit proof of compatibility prior to use of the curing compound.

- d. Field Curing and Protection of Concrete Test Cylinders: Provide and maintain for the use of the Testing Laboratory adequate facilities for the safe storage and proper curing of concrete test cylinders on the site as required by ASTM C31. The cost for providing these facilities shall be part of this contract.
- J. Screed Coat-Membrane Waterproofing: Apply screed coat, approximately 1/2 inch thick unless otherwise shown or required, composed of 1:3 cement mortar, floated level, smooth and even, over slab receiving membrane waterproofing.
- K. Environmental Conditions:
 1. Cold Weather Concreting: Approved practices for winter concreting, protecting and curing shall follow those outlined in ACI 306. Only the specified non-corrosive, non-chloride may be used. Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
 2. Hot Weather Concreting: Take preventative measures recommended in ACI 305 to control temperature of concrete prior to and after placement. When temperature and/or humidity conditions require its use, the specified water reducing, retarding admixture may be used.

3.7 FLOOR FLATNESS/LEVELNESS TOLERANCES

- A. F_F defines the maximum floor curvature allowed over 24 inches. Computed on the basis of successive 12 inch (300 mm) elevation differentials, FF is commonly referred to as the "Flatness F-Number:"

$$F_F = \frac{4.57}{\text{Maximum difference in elevation, in decimals of inches, between successive 12 inch elevation differences.}}$$

- B. F_L defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 foot (3.05m) distance:

$$F_L = \frac{12.5}{\text{Maximum difference in elevation, in inches, between two points separated by 10 feet.}}$$

- C. Floors shall be measured in accordance with ASTM E1155 "Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound Units)."
- D. Slabs shall achieve the specified overall tolerance. The minimum local tolerance (1/2 bay or as designated by the Architect) shall be 2/3 of the specified tolerances.

3.8 FINISHING

- A. Base Slab - Floor or Roof:
 1. Scratch Finish: For top of concrete surfaces receiving cement coat waterproofing or other bonded cementitious finishes:
 - a. Strike off concrete; consolidate and level off to required elevation. The finished surface shall be level and to a FF 15/FL 13 tolerance. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes or rakes.

- b. Before application of bonded topping, remove dirt, oil, loose aggregate and laitance from the surface with stiff wire brooms and leave coarse aggregate slightly exposed. Protect the scratched surface until topping is placed. New topping shall be placed after specified bonding compound has been applied and has dried.
 2. Float Finish: For horizontal surfaces receiving insulation, felt waterproof membrane or sand bed terrazzo or as indicated:
 - a. The concrete shall be placed, consolidated, struckoff and leveled. After the concrete has stiffened sufficiently to permit the operation and the water sheen has disappeared, the surface shall be floated at least twice, to a uniform sandy texture with a power-driven float. Hand floating with a wood float shall be done in areas not accessible to the machine.
 - b. The finished surface shall be within 5/16 inch above or below the specified elevation and shall achieve an FF 20/FL 17 tolerance with shores in place.
 - c. High and low spots exceeding these tolerances shall be brought to required elevations before concrete has hardened and then refloated to a smooth uniform surface. If concrete has hardened, high spots shall be ground down and low areas filled with material acceptable to the Architect.
 3. Steel Trowel Finish: For interior floor slabs with monolithic finish or rubber type membrane waterproofing, paint, roof slabs, applied floor covering (tile etc.) or future floor slabs over which a temporary finish is applied:
 - a. The concrete shall receive a floated finish as previously specified. The surface shall then be troweled, at least twice, to a smooth, hard, dense surface free of blemishes or trowel marks.
 - b. The finished surface shall be flat and level to achieve an FF 25/FL 20 tolerance. In addition, the entire floor surface must be within plus/minus 3/4 inch of the floor elevation indicated on the plans.
 - c. High and low spots exceeding these tolerances shall be brought to required elevations before concrete has hardened and then refloated to a smooth uniform surface. If concrete has hardened, high spots shall be ground down and low areas filled with the specified underlayment compound in a manner acceptable to the Architect.
- B. Concrete Finish – Stairs:
 1. Concrete Stairs: Treads, Risers, Platforms & Landings:
 - a. Finish shall be steel troweled as specified herein unless otherwise shown.
 - b. Surfaces are to be made non-slip.
 - c. Install flush, preformed abrasive tread nosings specified under another section of the specifications.
 - d. See architectural drawings for additional requirements.
 2. Steel Stairs: Treads, Platforms & Landings:
 - a. Concrete topping mix shall be installed directly on steel pan stair construction. Reinforce each tread and platform with galvanized wire fabric, 1/2 inch mesh, No. 19 wire, full area of steel pans and laid in center of cement. Concrete topping shall consist of cement, sand and 3/8 aggregate. Maximum slump shall be 4 inches with a compressive strength of 2500 psi.
 - b. Mix materials mechanically for 2 to 3 minutes and then screed and float mortar to a compact smooth surface. When pressure from a finger fails to make an indentation on surface, steel trowel to final finish.

- c. Surfaces shall be made non-slip.
- d. Install flush stone treads as specified under another section of the specifications.
- e. See architectural drawings for additional requirements.

C. Wearing Surface Treatment:

1. Non-Slip Finish: Apply non-slip aggregate not less than 30 minutes after slab has been floated to its final position, or when pressure from finger fails to make an indentation on surface. Aggregate shall be soaked in clean water for about 15 minutes, shall be sprinkled uniformly over surface and floated into concrete until aggregate is thoroughly embedded but not entirely below the surface. Apply steel trowel finish.
2. Sealer/Dustproofing (Surface Film Treatment): Wearing surface to receive surface film treatment shall be dry, clean and free from oil, grease or other foreign matter that would affect the proper application and penetration of the materials used. The penetrating dustproofing treatment, of selected color, shall be applied by manufacturer of the materials.
3. Floor Dustproofing (Penetrating Treatment): Treat floors to be dustproofed with a concrete surface dustproofing compound of magnesium fluosilicate, applied in strict accordance with the manufacturer's instructions.
4. Metallic Floor Hardener:
 - a. Metallic floor hardener and dustproofer shall be a premixed, ready-to-use material; proportioned, blended and packaged at the manufacturer's own plant and delivered to the job ready to apply at the rate of 15 pounds per 100 square feet.
 - b. Broadcast mixture over surface of freshly floated concrete in two separate shakes. Finish with a steel trowel to produce a smooth level surface. Application shall be made in strict accordance with manufacturer's recommendations and directions.
 - c. The manufacturer of the hardener shall provide at no cost the services of a trained technician during the initial periods of installation. Give a minimum of three (3) days notice to the hardener manufacturer prior to initial use of the product.
5. Non-Metallic Floor Hardener:
 - a. Non-metallic floor hardener and dustproofer shall be a premixed, ready-to-use material; proportioned, blended and packaged at the manufacturer's own plant and delivered to the job ready to apply at the rate of 12 pounds per 100 square feet.
 - b. Broadcast mixture over surface of freshly floated concrete in two separate shakes. Finish with a steel trowel to produce a smooth level surface. Application shall be made in strict accordance with manufacturer's recommendations and directions.
 - c. The color shall be as indicated on Finish Schedule.
 - d. The manufacturer of the hardener shall provide at no cost the services of a trained technician during the initial periods of installation. Give a minimum of three (3) days notice to the hardener manufacturer prior to initial use of the product.

D. Exposed Concrete Finishes: See architecturally exposed concrete section.

3.9 GROUTING

- A. Grout, except under steel bearing or base plates, shall be composed of one (1) part cement to one (1) part loose sand by volume and shall have a 2 inch maximum slump. Mix together dry until mixture has even color and then add water while mixing until grout is of required consistency.

3.10 DRY-PACKING AND WEDGING

- A. Install steel wedges and cement mortar dry packing where shown on drawings to provide even transfer of loads for existing structure to new supporting construction.
- B. Cement mortar for dry packing shall be 1:2 mix with only sufficient water to dampen mix and shall be rammed in place.

3.11 EPOXY JOINT FILLER

- A. Contraction or construction joints, in areas receiving metallic or mineral aggregate hardener, shall be filled with specified epoxy joint filler. The epoxy joint filler shall be mixed and installed in strict accordance with manufacturer's instructions. The joint shall not be filled sooner than 90 days after slab placement.

END OF SECTION

SECTION 033300

ARCHITECTURAL CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents

1.2 WORK INCLUDED

- A. Work of this Section includes requirements for architectural cast-in-place concrete work including concrete materials, mix design, formwork, reinforcement, placement and finish treatments. Work of this Section shall be supplemental to the Cast-in-Place Concrete Section.
- B. Work of this Section includes all labor, materials, equipment and services necessary to complete the architectural cast-in-place and precast concrete as shown on the drawings and/or as specified herein.

1.3 RELATED SECTIONS

- A. This Section includes additional requirements for and relating to the following sections:

- 1. Section - Cast-in-Place Concrete

1.4 STANDARDS

- A. Comply with standards listed herein and in Cast-in-Place, Formwork, Reinforcing and other Concrete Sections.
- B. Comply with the following Publications of the American Concrete Institute (ACI)
 - 1. Recommendations of Chapter 11 – Formwork for Architectural Concrete
 - 2. ACI 303R Guide for Architectural Concrete

1.5 QUALITY ASSURANCE

- A. The cast-in-place concrete Subcontractor, carpenter foreman, labor foreman and the reinforcing erector foremen shall have successful experience in performing architectural cast-in-place concrete work and shall be approved for work on project. Submit projects, including name, description of responsibilities, scope of work, and references.
- B. Concrete Quality Control Technician: Assign a quality control person to oversee the architectural concrete work. The primary duty is to be responsible for the required execution of the work.
- C. Project Pre-construction Meeting: After approval of products and color samples and as early as possible, but not less than 30 days prior to the fabrication of the formwork, the Contractor shall schedule a meeting at a mutually agreed time.

The meeting shall include the Architect, the Contractor, the Concrete Subcontractor, Formwork Fabricator, Labor Forman and Concrete Supplier. Meeting agenda will be to discuss the materials, methods of forming and placing, coordinating and quality control procedures involved in the Architectural Cast-in-Place Concrete work and the interface with the non-architectural and related work.

1.6 SUBMITTALS

- B. General: Do not proceed with the construction of the cast-in-place architectural concrete in the project, including fabrication of the formwork, until all samples, product data, mock-up and shop drawings have been approved by the Architect.
- C. Formwork Shop Drawings:
 - 1. Submit drawings showing the layout and details of formwork for the work, including the mock-ups. Show layout of all form joints, crack control joints, construction & expansion joints, tie locations and exposed embedments. Show details of shop assembly of formwork and field assembly of construction and control joints, reveals, recesses, embedments, ties, back-up, clean out panels, and the means to be used to tightly seal all joints and maintain alignment.
 - 2. Reinforcing steel cover, location of clear placing passages through reinforcing for placing trunks.
- D. Placing: Submit layout or description of each placement showing sequence and projected time between deposits.
- E. Product Data: Manufacturer's name and technical information for each of the following products:
 - 1. Cement.
 - 2. Aggregates, each type
 - 3. Admixtures, each type
 - 4. Form surface material, each type
 - 5. Compressible Foam gaskets.
 - 6. Form release coating
 - 7. Reinforcing accessories
 - 8. Form ties
 - 9. Curing compound.
 - 10. Etch/Cleaning solution

11. Water repellent/Anti-graffiti sealer
12. Inserts and embedments, each type
13. Concrete mix supplier certification
14. Qualifications for Concrete Carpenter, Laborer, Reinforcing Steel Foremen and designated Quality Control Person

F. Samples:

1. Formwork contact materials, each type, 12 inches square
2. Reveal form strips, each size, 12 inches long
3. Foam gaskets, 12 inches long
4. Form ties, one each type
5. Reinforcing supports, tie wire, one each type
6. Concrete Samples for color determination:
 - a. Submit the following
 - b. Concrete color samples: 12"x12"x1", cast flat, using specified form material, to establish the color. Finish with specified finish, one application, full strength. Submit as required to attain approval of the Architect.
 - c. Submit the following:
 - 1) 25% light gray +50% white cement and 25% Granulated Slag
 - 2) 50% white cement and 50% Granulated Slag
 - 3) submit up to 4 samples of 4 variations of cement/slag mix as directed by the architect.
7. Final Samples:
 - a. Submit samples of approved color mix and finish treatment, with specified finish for record:
 - b. Three 12"x12"x2-1/2" cast vertically for wall. Cast each vertical cast panel simulating techniques to be used in production casting to reduce the surface air voids and achieve the specified criteria.

G. Mock-up for Formed Concrete Work:

1. After all samples, product data, and the shop drawings for the Mock-up are approved construct a mock-up of the work in a location approved by the Architect and as described below.
2. Mock-up shall consist of the following:

- a. Foundation of a size and reinforcement adequate to support the work.
 - b. Soffit slab: approximately 12ft. x 10ft with exposed soffit surface with butt form joints. 11ft long wall, 4ft long wall, all 8ft high. Liner on outer surface of long wall. Liner on inner surface of short wall and part of long wall at the corner. Liner on wall ends. Smooth form on all other surfaces
 - c. One horizontal construction joint and one vertical construction joint.
 - d. One crack control joint with internal device on both sides..
 - e. Fiberlass ties
 - f. Reinforce as in a typical building wall. Add additional reinforcement as required for support.
 - g. Use approved form face material, reinforcement and accessories and assemble formwork as intended to be performed for the building construction.
 - h. Place concrete with methods to be used for typical placements in building, including anticipated time delays between deposit lifts.
 - i. Finish exposed hardened surfaces with specified finishes when directed by the Architect.
 - 1) Architect shall be present when finishing is applied.
 - 2) Apply abrasive blasting application to spandrel ribbed surface.
 - 3) Apply etch-Clean application to smooth vertical surfaces.
 - 4) Apply sealer to surfaces when directed by the architect.
3. If mock-up is not approved by the Architect, remove and replace with full or part of mock-up as directed by the architect at no additional cost.
 - 4 Mock-up shall be located so it can remain throughout construction. Protect mock-up from damage during construction. Remove mock-up when directed by the Architect.
 5. See Mock-up scope drawings at the end of this section.
- H. Concrete mix designs: As specified in Section "Cast-in-Place Concrete" and using criteria specified herein.

1.7 PERFORMANCE REQUIREMENTS

- A. Responsibility for the design of Cast-in-Place Architectural Concrete in conformance with the requirements of the drawings and specifications and

performed using the highest standards of quality for visual and durable concrete rests with the Contractor.

- B. Design of the mix and formwork shall be performed by Contractor's registered professional Engineer, registered in the State where the project is located, and submittals for the same shall be sealed by said Engineer. Design shall include structural integrity, alignment and formwork tightness under placing pressures that will be encountered.
- C. Performance Criteria: All cast-in-place architectural concrete formwork shall be performed so that no evidence of the following will be evident when the concrete is subject to imposed loads, temperature and weather conditions:
 - 1. Damage of any kind.
 - 2. Cracking, other than at control joints, due to improper forming and placing.
 - 3. Out of alignment or incorrect profiles.
 - 4. Surface voids not completely covered by a circle 11/16 inches in dia. (10 cent coin) or more than 25 surface voids larger than 1/8 inch, in longest dimension, in any area 1 ft. square.
 - 5. Voids, sand pockets or discoloration due to fluid loss through the formwork.
 - 6. Rockpockets and honeycombs.
 - 7. Discoloration of any kind, including that caused from staining and from improper placing of the concrete.
- D. If any of the above-mentioned deficiencies occur, the Architect may order the affected concrete replaced or repaired with acceptable concrete. Repair only when directed by the Architect. Corrected deficiencies must meet with the Architect approval.

PART 2 PRODUCTS

2.1 GENERAL

- A. All materials shall be new or like new condition free from defects which will impair achieving the specified durability or appearance of the Architectural Cast-in-Place Concrete.

2.2 CONCRETE MATERIALS

- A. Each concrete material shall be the product of a single plant and raw material source throughout project.
- B. Cement: ASTM C-150, Type I or II as follows:
 - 1. Cement shall consistent in color presentation throughout the duration of the project.

2. Cement shall be locally available Type I or II, light gray cement and white cement, proportioned as determined in samples specified in 1.6F,6c.
 - C. Coarse Aggregate: ASTM C-33. Hard crushed stone or rock. If aggregate has particles finer than passing a #20 sieve, the particles shall be light gray or light tan in color. Maximum size aggregate shall be 3/4". Coarse aggregate from Haverstraw or Clinton Point, NY are acceptable materials.
 - D. Fine Aggregate: ASTM C-33. Hard natural sand. If aggregate has particles finer than passing a #20 sieve, the particles shall be light gray or light tan in color. Fine aggregate from Long Island, NY is an acceptable material.
 - E. Admixtures:
 1. All admixtures must be certified to be compatible with the cement, aggregates, and all other constituent materials in the mix and shall contain less than 0.05% of Calcium Chloride.
 2. Water Reducing Admixture: ASTM C-494, Type F or G
 - a. Regular Concrete: High Range (HRWR): Rheobuild or Glemium by Master Builders, Cleveland, OH; Eucon by The Euclid Chemical Company, Cleveland OH; Daracem by W. R. Grace, Cambridge, MA., or approved equal.
 3. Cement Replacement Admixture:
 - a. White Granulated Blast Furnace Slag; "NewCem" by LaFarge Cement Co.
 - b. White Metakaolin: "Metamax" as produced by BASF/Englehart Corp., Baltimore MD.
 - c. Fly Ash or Silica Fume not permitted in Architectural Concrete.
 4. Air Entraining Admixture: ASTM C-260. (for concrete exposed to weather in the final structure).
 5. Admixtures for retardation and acceleration may be used if shown there is no adverse effect on architectural requirements and are approved for use.
 - F. Water: Potable
- 2.3 FORMWORK MATERIALS
- A. Form surfaces shall be as follows:
 1. Textured surfaces: Surfaces designated Type "A" and "A2" on the drawings shall be a liner with a special textured pattern designed by the architect.

- a. Liner shall be an Elastomeric sheet bonded to a $\frac{3}{4}$ " thick plywood backing sheet.
 - b. Liners shall be manufactured by Spec Formliners, Santa Anna, CA; or Fitzgerald Formliners, distributed by Engineered Devices Corporation, Ridgefield Park, NJ.
2. Smooth flat form surfaces: Surfaces designated Type "B" on the drawings shall be High Density Plastic Overlay plywood, $\frac{3}{4}$ " thick, 3'-4" x 8'-8" panels to cover surface areas between joint lines shown on the drawings. Panels shall be "Pourform 45" by Ainsworth; "Multipour" by Simpson; "Armor Ply" by Sylvan Industries, or equal.
 3. Unexposed Surfaces: Surfaces designated Type "C" shall be $\frac{5}{8}$ " B-B plywood surfaces.
- B. Form Ties: Shall be manufactured specifically for use as concrete ties and shall be designed to seal tightly to the form face material without fluid loss. Ties shall be of sufficient strength to resist fluid concrete placing pressures at the longest span of support used in project. Ties shall be one of the following as selected by the architect on the mock-up.
1. Ties shall be fiberglass rod ties with screw activated gripper clamps with a screw adjustment spreader.
 2. Ties shall be as supplied by Engineered Devices Corp., Ridgefield Park, NJ., or approved equal.
- C. Joint Sealing Material:
1. Foam gaskets for sealing field erected corner form joints shall be foam rubber or neoprene tape, paper backed, with pressure sensitive, adhesive on one side, and shall be of sufficient widths, thickness and compressibility for specific use. Tape shall be as manufactured by Frost King, Patterson, NJ, or approved equal.
 2. Sealant for sealing permanent shop or bench fabricated unrevealed joints shall be silicone caulking. Sealant shall be "Silprif" as manufactured by General Electric; "Silicone caulk" by DAP Corp., or approved equal.
- D. Form Release Coating: Colorless, non-staining and having no deleterious effects on the concrete, manufactured specifically for non-absorbent surfaces and for reducing surface voids. Release Coating shall be "Cretese 880" by Cresset Chemical Co., Weston, OH, or approved equal.

2.4 REINFORCING AND ACCESSORIES

- A. Accessories in contact with vertical form surfaces shall be high density plastic "wheels". Feet in contact with the form shall be maximum $\frac{1}{8}$ "x $\frac{1}{2}$ ". Center hole engaging reinforcing shall hold the wheel tight to the bar and maintain the dimension required under placing conditions.

- B. Accessories in contact with exposed soffit or beam bottom forms shall be high density plastic units with a maximum of four support legs. Each leg, where in contact with the form surface shall be a maximum of 1/8"x 3/8". Units to have fittings for attaching carrier bars supporting the reinforcing steel mat. Multi-leg string spacers will not be permitted
- C. Multi-leg string spacers will not be permitted.
- D. Tie wire used to secure reinforcing steel adjacent to architectural form surfaces shall be non-corrosive or plastic coated wire.
- E. Accessories by Aztec, Atlanta, GA; W .R. Meadows, Inc., Hampshire, IL; Engineered Devices Corp., Ridgefield Park, NJ., or approved equal.

2.5 MISCELLANEOUS MATERIALS

- A. Curing Material: VOC compliant, colorless, diffusive, blend of Sodium, Potassium and Meta Silicate and be able to retain water in concrete with minimal loss during high temperatures and without rapid loss of moisture. Shall not contain wax, resin or acid. Material shall be "L&M Cure" by L&M Construction Chemicals, Inc. Omaha, NE; "SealTight Med-Cure" by, W .R. Meadows, Inc., Hampshire, IL., or approved equal.
- B. Concrete Clean/Etching Solution: Shall be a commercial concrete cleaner containing solvents, chloride acids and stain removers, with no more than 1.5% acid content. Solution shall be "Sure-Klean Heavy Duty Concrete Cleaner", by ProSoCo, Lawrence, KS.
- C. Water Repellent and Anti-Graffiti Sealer: shall be a low molecular, minimum 95% solid, Clear, Silane sealer. Sealer for all surfaces shall be "SLX-100"(Oleophobic) by ProSoCo, Lawrence, KA.
- D. Patching Additive: Shall be a liquid, acrylic-polymer bonding agent specifically made to be integrally mixed with mortar. Additive shall be "Acryl Set" by Master Builders-Degusa or approved equal.
- E. Gasket adhesive remover shall completely remove any adhesive residue and shall not discolor concrete surface. Remover shall be "Asphalt and tar remover - 509" by ProSoCo, Lawrence, KA.

PART 3 EXECUTION

3.1 CONCRETE MIXTURES

- A. Comply with the requirements of Section for Cast-in-Place Concrete, and as specified herein
- B. Regular concrete shall have the following:
 - 1. Gray cement or a blend of gray and white cement as determined from samples performed in 1.6 F,6c

2. Cement Replacement Admixture in amounts allowed to meet strength and color requirements, but a minimum of 25% of the cementitious material.
 3. High Range Water Reducing Admixture.
 4. Air Entraining Admixture, 4 to 6% in all concrete exposed to weather conditions in the finished work.
 5. Color shall be as selected in part 1, sample selection.
- C. Mix shall be designed for minimum water content allowable by requirements of materials and batching and placing methods (optimum slump prior to admixture: 2.0 inches and water/cement ratio of 0.40 or less). Concrete fluidity shall be attained by the addition of HRWR to a slump spread of $6\pm\frac{1}{2}$ " ($4\pm\frac{1}{2}$ " at stairs and ramps).
- D. Mix design shall designate the optimum duration of fluid stability for the mix for the maximum discharge time planned.

3.2 FORMWORK

A. Form Fabrication:

1. Comply with Section "Concrete Formwork", and as herein specified.
2. Design formwork to permit easy removal. Prying against the concrete will not be permitted. Care shall be taken so as not to mar the concrete surface in cutting or removal of the forms.
3. The forms shall be completely rigid and strong enough to withstand without deflection, movement or fluid loss at the high hydraulic pressures that result from the rapid filling and vibration required for architectural concrete placing. Hydraulic pressures: Design forms to limit deflections of plywood supports to $L/300$. Formwork shall be designed for a minimum placement rate of 8 ft/hour. In forms higher than 8 feet formwork shall be designed for a higher rating if the concrete set rate is determined by the mix analysis to be fluid longer than the rate of placement.
4. Forms shall be fabricated so the concrete can be adequately placed, vibrated and finished to achieve the specified finishes.
5. Layout form ties, form joints, reveals, slab bulkheads and exposed embedments as shown on the drawings. In areas not shown, joints and tie holes shall be laid out symmetrically about the form joint lines and breaks as near the pattern shown as possible.
6. Textured Type "A1" and "A2" surfaces:
 - a. Formwork and Liner application shall be fabricated in a shop and not field cut and bonded.
 - b. Lined panels shall be square and have square edges fabricated to the profiles and sizes shown.

- c. Securely bond the liner to the backing panels using materials and techniques as directed by the manufacturer and to accommodate the design requirements. Fasten to prevent loosening of liner during concrete placement.

7. Smooth Type "B" surfaces:

- a. Edges of plastic overlay form panels shall be square, flat and sealed. Seal all cut edges (end grain, including tie holes) with liquid polyurethane.
- b. Install sealant in all gang make-up butt joints of plastic overlay form panels to prevent fluid loss. At butting plywood panel edges place a bead of sealant (1/8" max) at back edge (away from contact face) of one panel prior to butting interface edge surfaces. See detail at the end of section.
- c. Back-fasten all plastic overlay form panels to back-up members with screws. 1/2" plywood (CDX) backing is acceptable.

B. Form Erection:

1. Use only form units where face panels are in undamaged condition. Replace damaged panels as required to maintain surface in a condition to achieve the specified treatment.
2. Use screw type fastening devices to close joints, maintain alignment, and to close joints at corners, construction joints and bulkheads. Apply pressure at joint to resist concrete placing pressure as close to the joint as possible.
3. At corner joints, assembled and disassembled in field, place a gasket in form joint. Install gasket away from contact edge 1/16" to 1/8".
4. Construction joints and crack control joints shall be at locations indicated on the drawings.
5. All corners shall be formed with a tight seal with back-up support secured with screw connectors at sufficient intervals to maintain the seal under placing pressures. Install intermediate wales and strongbacks between tie rows as required to maintain joint seal. All columns shall be yoked with wales and thread rods to apply pressure on corner joints.
6. Liner type "B" panels: Provide form strips at all edges with the profile as shown on the architects drawings. See drawings at the end of this section.

C. Tie Holes:

1. Ties shall be located where shown on the drawings. Where placing loads are deemed excessive using locations shown tie layout shall be submitted for approval.

2. Drill tie holes in liner or plastic overlay form panels from contact face using brad point twist bit with edge cutters (scribes circle edge prior to surface cutting).
- D. Coating of Forms: Prior to use, all forms shall be coated with the specified form release coating in accordance with the manufacturer's written instructions.
 1. Coat evenly and remove excess material from form surface with a damp absorbent cloth.
 2. Surface applied with specified release agent shall not be oily to the touch.
 3. Do not allow coating to come in contact with previously placed concrete or with reinforcing steel.

3.3 FORMWORK TOLERANCE

- A. Finish Lines: Fabricate and position formwork to maintain hardened concrete finish lines within the following allowable variations.
 1. From designed edge elevation in 10 ft. 1/4 inch
 2. From designed vertical plane in 10 ft. 1/4 inch
 3. Cross-Sectional Dimensions:
Plus or Minus 1/4 inch
 4. Smooth form surface to surface at butt joint 1/32 inch
 5. Flatness of soffit surfaces in 10 ft. 1/4 inch
- B. Floor surfaces shall be finished to 1/4" in 10 feet

3.4 REINFORCEMENT

- A. Comply with the requirements of Section "Concrete Reinforcement", and as specified herein.
- B. Support accessories are to be used at exposed vertical surfaces only when absolutely necessary to maintain cover. In general tie vertical bars to dowels at base of placement and fix in position by using across-the-form supports above the form top. Where necessary place "wheel" supports at walls no closer than 6 ft. apart. Multi-footed supports are not permitted in architectural concrete.
- C. Layout reinforcement to assure a clear passage from top to bottom of walls and spandrels at least 10 feet apart. Clear passage shall be free of bands, ties, conduit and other obstructions to allow easy insertion of the pump hose or placing trunks to the bottom of the form.
- D. Reinforcing support units at horizontal surfaces shall be laid out a minimum of 3 feet apart in a symmetrical pattern along the form panel joint lines and used with

carrier bars spanning between carrier bars to support designed reinforcing steel. Carrier bars may be used as designed reinforcing if approved by the Architect. Multi-footed string supports are not permitted in architectural concrete.

- E. Tie wire for reinforcing steel shall be tied in a manner so that wire ends will point away from the architectural formwork surface and not project into the clear cover area between the bars and the form surface.
- F. All reinforcing steel, including bands, shall be secured a minimum of 2" from the formwork surfaces exposed to weather and as directed by the structural drawings for surfaces not exposed to weather.

3.5 MIXING AND TRANSPORTING CONCRETE

- A. All concrete for each placement, or a minimum of two truck loads shall be on the site prior to starting the placement. The concrete shall be completely discharged into the forms within the time determined by the design mixes to be the optimum duration of fluid stability provided by the mix design. In no case will the concrete be placed after excessive stiffening of the concrete has occurred. Discharge two trucks into the pump or bucket at one time in a manner that will enable one truck to be half full and discharging while the other is finished and being replaced with another truck.

3.6 PLACING CONCRETE

- A. Before placing concrete in the forms, verify that all forms have met all requirements specified; that reinforcing steel, embedded materials are in place and securely anchored; that forms are absolutely clean; and that entire preparation has been approved by the Concrete Quality Control Technician and has been reviewed by the Architect.
- B. Cleaning Forms: Immediately prior to placing concrete, clean all form interiors free of foreign material and debris.
 - 1. Force debris out of forms prior to closing the last section with a jet stream of compressed air and/or water. Where form openings are not available, collect debris with vacuum cleaners and heavy duty magnets. Remove all wire clippings, sawdust and other debris from wall, beam and soffit bottoms.
 - 2. Protect cleaned forms if placing does not commence immediately, covering openings with tarpaulins.
- C. Depositing Regular Concrete:
 - 1. Concrete for walls, columns and spandrels more than 3 ft deep shall be placed with trunks, or pump hoses inserted onto the form cavity.
 - 2. Deposit concrete as nearly as practical at its final position, but not farther than 5 ft. horizontally from the final position

3. Do not drop concrete more than 30 inches.
4. Place concrete by inserting pump hose, or placing trunks into form to near face of fresh concrete. Place an adequate number of trunks in wall and deep spandrel forms to enable a continuous placement without causing delays in moving trunks.
5. Deposit layers in walls or deep spandrels shall not exceed 30 inches in height. Top deposit lift of placement shall not exceed 16 inches in height.
6. All deposits of concrete in walls, beams or slab placements shall have a subsequent deposit place on top and/or adjacent to the fresh face and consolidated within 30 minutes. Plan floor placements so the sequence of deposits follows this requirement.

D. Consolidation:

1. Regular Concrete:

- a. All concrete shall be consolidated by internal vibration using two vibrators at each placement. One vibrator shall follow deposit location and consolidate concrete after deposit is leveled.
- b. Optimum diameter of vibrator head at shall be 1" to 1½".
- c. Vibrators shall be placed into the concrete vertically at a consistent spacing that will thoroughly blend the deposits, remove entrapped air, and consolidate the concrete. Vibrator head shall be inserted rapidly and withdrawn slowly and evenly to remove maximum amount of entrapped air (optimum withdrawal speed approx 2" to 4" per second). Do not jiggle vibrator up and down during consolidation, use continuous and even insertion and withdrawal of vibrator.
- d. Apply external vibration by manually hammering forms just below deposit area with rubber mallets in an even and consistent manner.
- e. After top out leveling in walls and spandrels, the concrete shall be allowed to set 10 to 15 minutes and then shall be given a final vibration of the top 20 inches. Immediately thereafter the top surface shall be finished as required.
- f. Caution must be exercised in using vibrators to prevent injury to the form surface material or displacement of embedded items.
- g. Keep one spare working vibrator on site at all times.
- h. Apply external vibration by manually hammering forms just below deposit area at corners and reveals with rubber mallets in an even and consistent manner.

3.7 CURING AND FORM REMOVAL

- A. Cure all concrete for a minimum of five days when temperatures are above 60 degrees.
- B. Cure formed concrete surfaces by one of the following methods:
 - 1. Leave the formwork securely in place and cover the exposed top surface tightly with polyethylene sheet. Cover shall insure protection from rain and allow minimal moisture loss from the concrete mass.
 - 2. Immediately after stripping, fog the surface (fine mist nozzle on hose...do not spray with garden sprinkler head) and apply the curing compound.
 - 3. Method used shall be used consistently throughout project.
- C. Form Removal:
 - 1. Comply with the requirements of Section "Cast-in-Place Concrete", and as specified herein.
 - 2. Care shall be taken so as not to mar the concrete surfaces in removing the forms. Do not touch concrete with any stripping tools, pull forms away from concrete.

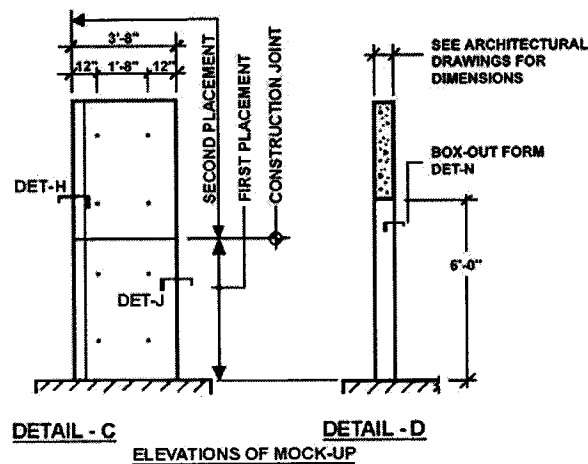
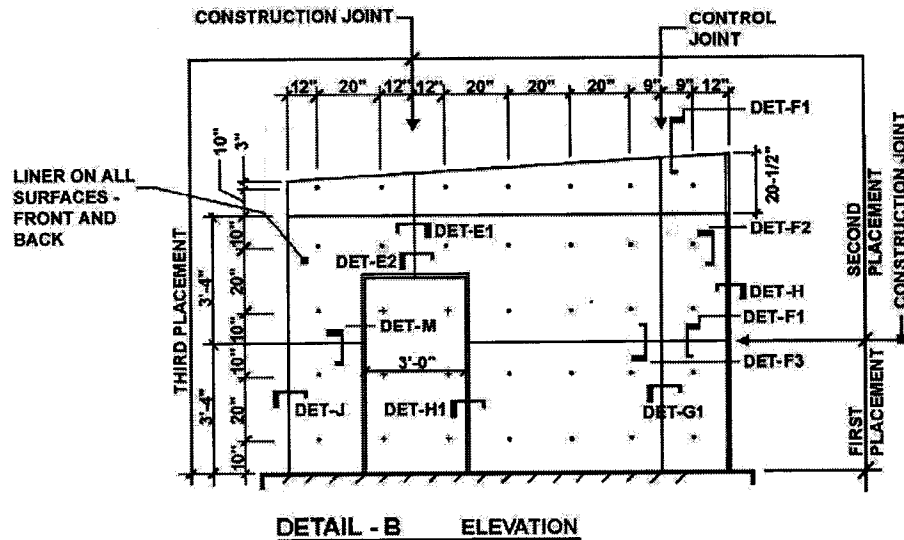
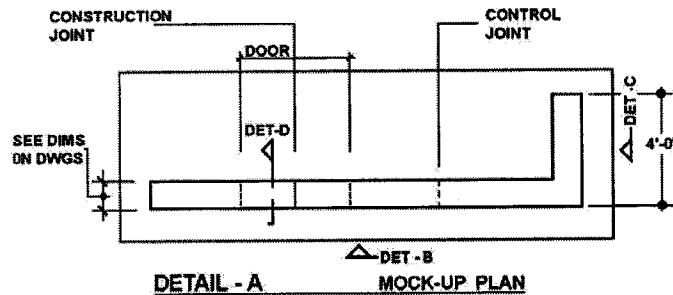
3.8 FINISHES FOR FORMED PLACEMENTS

- A. Shall be finished with the approved finishes determined from sample tests executed in Part 1 on the Mock-up. Finishes shall be as specified herein as indicated on the drawings. Minor defects may require fins to be removed (i.e. top trowel edges) or minor patching performed, however, it is the intent of this specification that the work will be performed in such a manner that only the specified etch/clean treatment, water repellent application, edge stoning, and tie hole treatment will be required after stripping.
- B. General: Prior to treating, all surfaces shall receive the following preparation and cleanup.
 - 1. All surfaces to receive treatment shall be a minimum of 21 days old. All surfaces can be treated at end of project.
 - 2. Remove all stains using an appropriate non-abrasive stain remover for each type.
 - 3. During operations, protect all adjacent work. At completion of day's work, leave area clean. At completion of work, remove all equipment, waste and excess material and leave area clean.
- C. Treat the smooth formed concrete surfaces, including exposed wall and spandrel tops, with the following applications:
 - 1. Etch-Cleaning Treatment for all smooth vertical surfaces:

- a. Use specified cleaner solution full strength.
 - b. Apply the number of applications to achieve the surface texture approved on the mock-up.
 - c. Apply cleaner in an even manner break to break and joint to joint of surface, allow to set for 3 to 5 minutes (time for the acid to neutralize), and thoroughly flush with water. Use a 30 to 45 degree nozzle tip and use pressure and flush water volume as directed by the manufacturer.
 - d. Treatment shall produce a "matte" surface by just removing the surface of the cement skin. Treatment shall not expose any aggregate larger than that passing a #25 sieve.
2. Water Repellant:
- a. Treat all vertical wall surfaces and exposed wall tops.
 - b. All surfaces receiving treatment shall be clean and free of stains and laitance. To all surfaces apply the specified sealer. All surfaces shall be dry as recommended by the manufacturer.
 - c. Apply one wet coat as per manufacturer's instructions.
- D. Formed Square Corner Edge Treatment (vertical and horizontal except at reveal edges): After concrete is hard use a fine masons stone on the edge to achieve an eased edge with a 1/16 inch radius. Take care not to scar the adjacent surface.
- E. Tie Hole Treatment: After all rods projecting from the in-place concrete are not needed for form support, cut fiberglass rod flush with the concrete surface without cutting devices making contact with the concrete surface and marring the surrounding concrete area.
- F. Patching: Only areas designated by the Architect shall be patched. Where minor patching is required as approved by the Architect as a means of rendering the surface acceptable, it shall consist of patching with a texture matching technique and color matching mortar mix. Test patches shall be placed on the mock-up or other approved surface and approved by the Architect prior to commencing any patching of the work. Final patching mortar shall be one part cement and two fine parts sand (maximum 00) mixed with a liquid acrylic-polymer bonding additive.
- 3.9 PROTECTION
- A. Protect all Architectural Cast-in-Place Concrete surfaces from damage of any kind. Pay special attention to surfaces near work of other trades. All Architectural Concrete surfaces shall be free of damage at the time of acceptance. This protection shall assure protection from paint, oils, rust, stains, impact, or any other kind.

3.10 MOCK-UP SCOPE – GRAPHIC REPRESENTATION

A. The following drawings describe the mock-up.

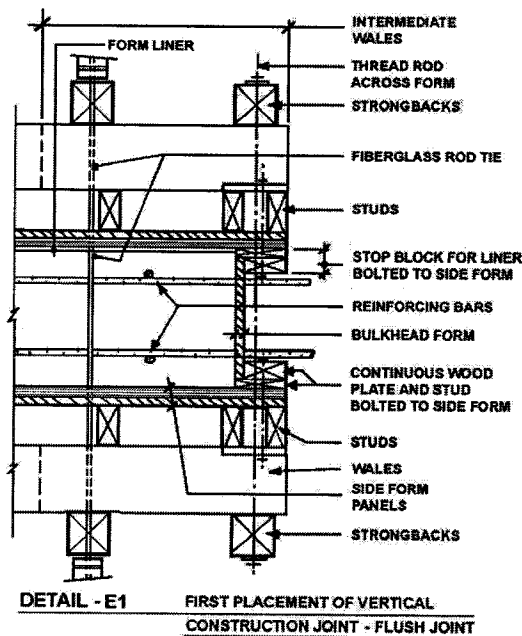


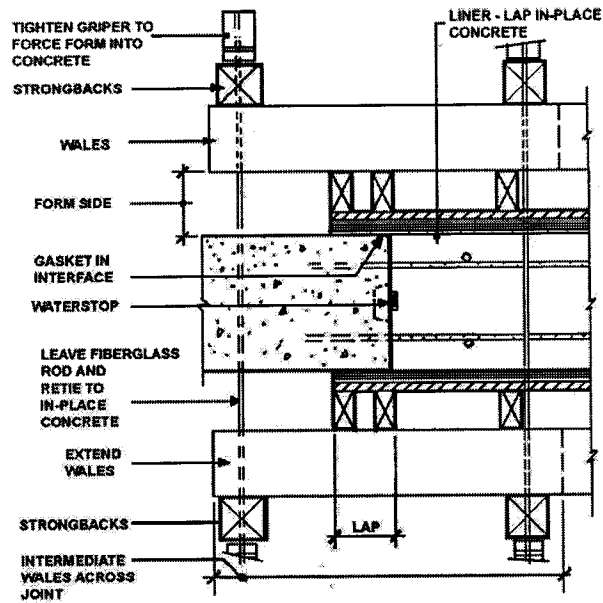
MOCK-UP SCOPE

END OF CONTRACT SECTION

3.11 QUALITY FORMWORK DETAILING EXAMPLES

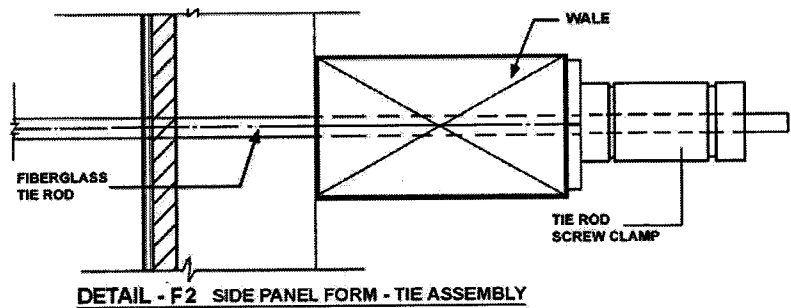
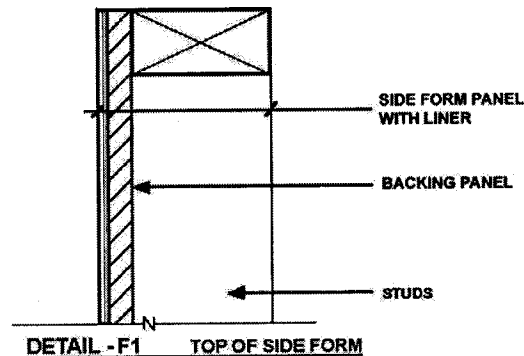
- A. The formwork drawings on the following pages are not part of the contract documents. They represent examples of the formwork principles required to perform the level of quality for work described in the contract documents and are intended to clarify the contract documents only.

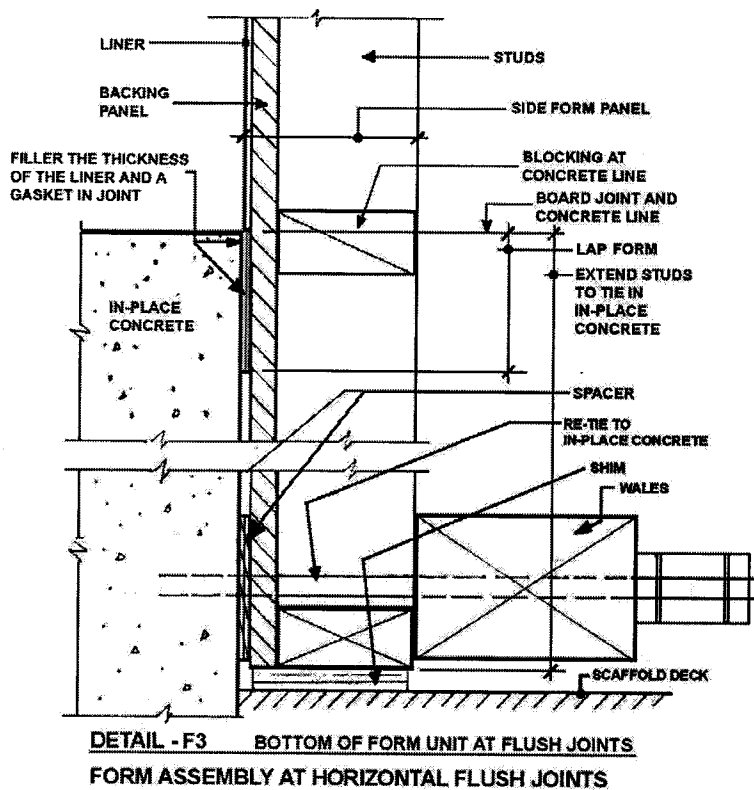




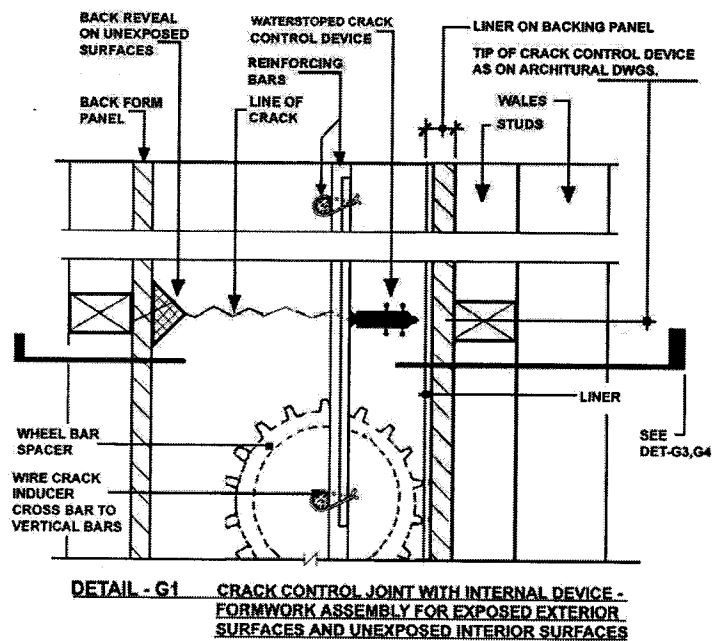
DETAIL - E2 SECOND PLACEMENT OF VERTICAL
CONSTRUCTION JOINT -FLUSH JOINT

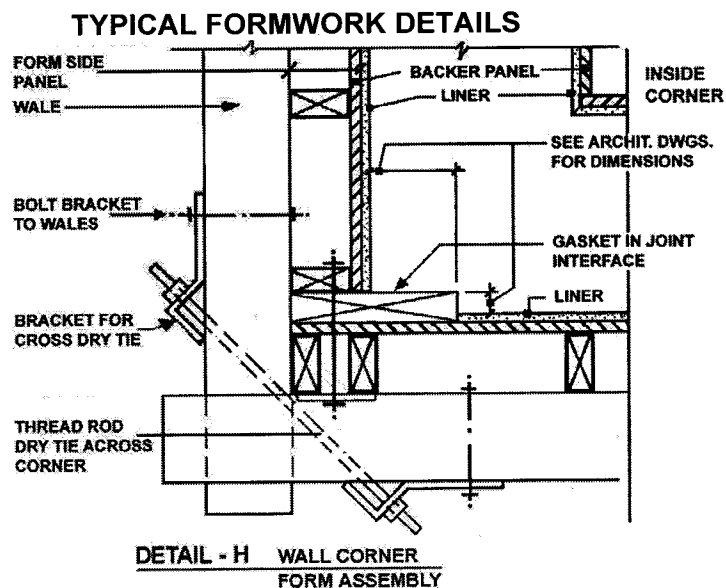
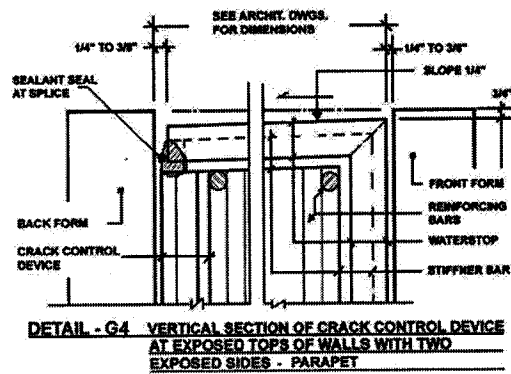
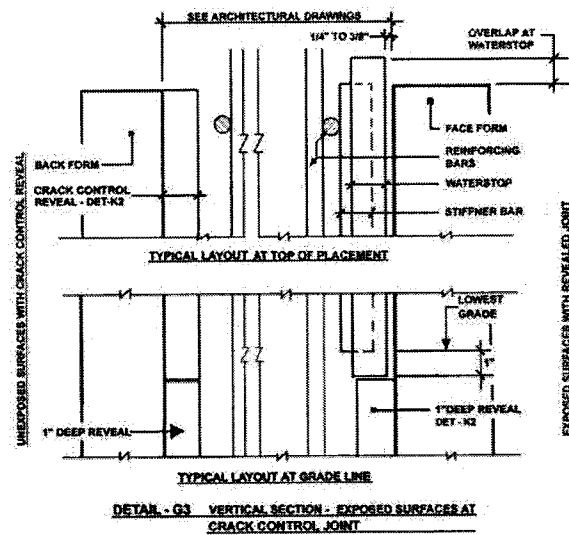
TYPICAL FORMWORK DETAILS

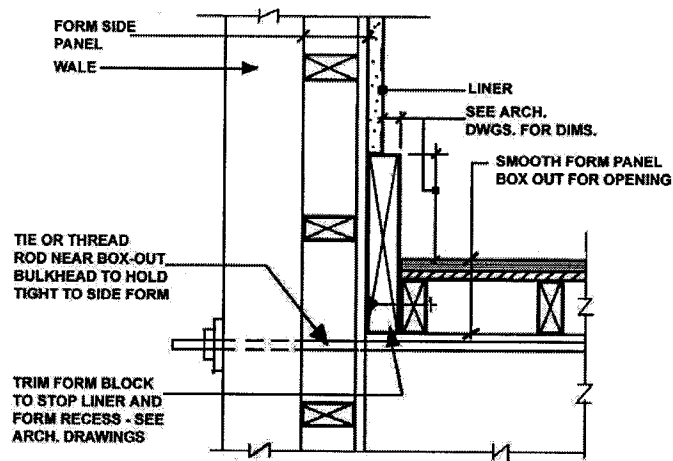
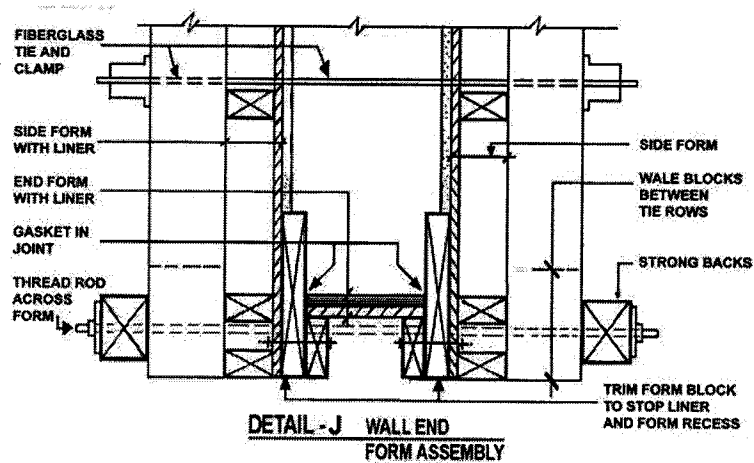




TYPICAL FORMWORK DETAILS

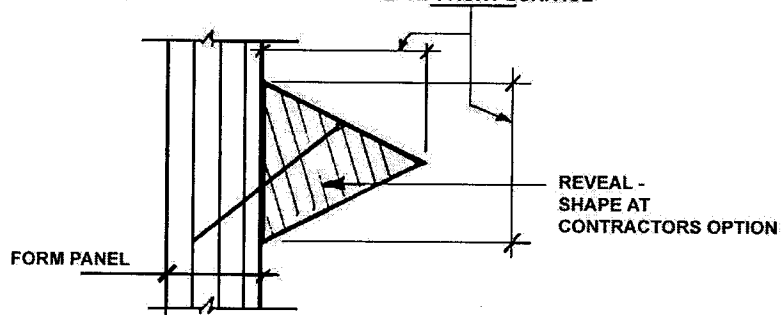


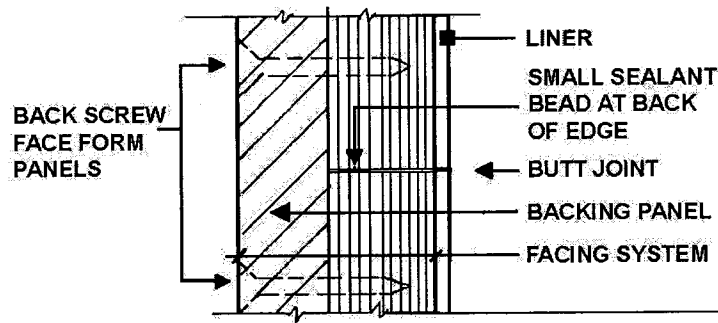
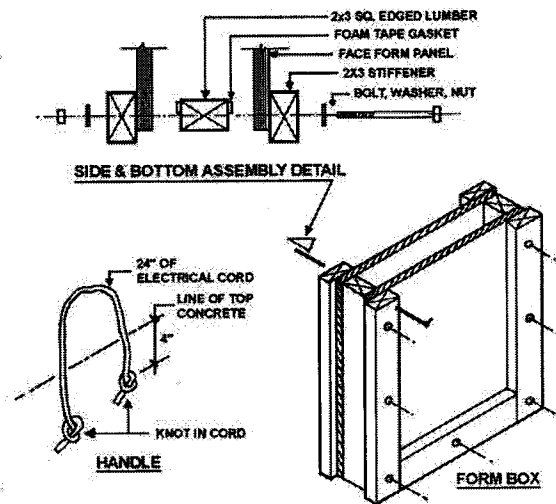
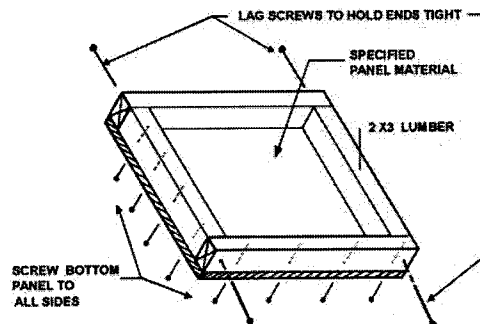


**DETAIL - H1 BULKHEAD AT AN OPENING****DETAIL - J WALL END FORM ASSEMBLY****TYPICAL FORMWORK DETAILS**

AT SURFACES EXPOSED TO GRADE
FILL REVEAL VOID IN CONCRETE
WITH MORTAR OR SEALANT

DEPTH:
1" MINIMUM AT BACK SURFACE
2" AT FRONT SURFACE

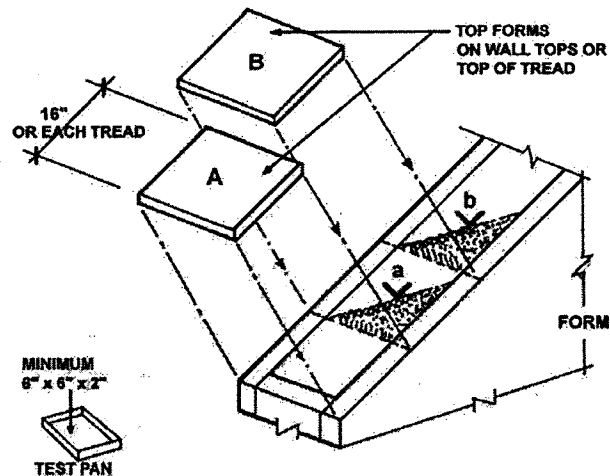
**DETAIL - K2 REVEAL AT UNEXPOSED SURFACES**

**DETAIL - M BUTT JOINT WITH SEALANT****DETAIL - X SAMPLE BOX FORM FOR VERTICAL CAST****TYPICAL FORMWORK DETAILS****DETAIL - Y SAMPLE BOX FORM FOR HORIZONTAL CAST**

STEPS:

1. CAST A TEST PAN OF CONCRETE AT START OF CONCRETE PLACEMENT
2. ATTACH THE TOP FORM-A
3. CAST CONCRETE UP TO LEVEL-a AND VIBRATE LAYER
4. ATACH TOP FORM-B
5. CAST CONCRETE UP TO LEVEL-b AND VIBRATE LAYER
6. PROCEED IN THIS MANER TO TOP OUT
7. WHEN TEST PAN CONCRETE IS STIFF START REMOVING LOWER FORMS AND FINISH TOP OF SLOPING WALL AS SPECIFIED.

FOR WALLS AND STAIRS THAT SLOPE MORE THAN 12.5 DEGREES
FROM HORIZONTAL



DETAIL - Z FORM ASSEMBLY AND PLACEMENT
OF SLOPING WALLS AND STEPS

TYPICAL FORMWORK DETAILS

END OF SECTION

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SECTION 034113

PRECAST CONCRETE HOLLOW CORE PLANKS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Precast planks.
- B. Connection plates with brackets and hangers.
- C. Grouting and reinforcing plank joint keys.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete.
- B. Section 033100 – Concrete Testing and Inspection.

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 1999.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary; American Concrete Institute International; 2002.
- C. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2003a.
- D. ASTM A 416/A 416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete; 2002.
- E. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2004.
- F. AWS B2.1 - Specification for Welding Procedure and Performance Qualification; American Welding Society; 2000.
- G. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2004.
- H. AWS D1.4 - Structural Welding Code - Reinforcing Steel; American Welding Society; 1998.
- I. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute; 1999, Fourth Edition.
- J. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1999.

- K. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Edition.
- L. PCI MNL-124 - Design for Fire Resistance of Precast Prestressed Concrete; Precast/Prestressed Concrete Institute; 1989, Second Edition.
- M. PCI MNL-126 - Manual For The Design of Hollow Core Slabs; Precast/Prestressed Concrete Institute; 1998.
- N. PCI MNL-135 - Tolerance Manual For Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.4 DESIGN REQUIREMENTS

- A. Design planks in accordance with the requirements of PCI MNL-120, PCI MNL 126, PCI MNL-124, ACI 318, and ACI 301. All structural precast planks shall conform w/ the design shown for the spans, loading conditions, and details shown on the drawings.
- B. Design connections in accordance with PCI MNL-123.
- C. Design components to withstand dead loads and design loads in the configuration indicated on the drawings and as follows:
 - 1. Floor Assembly: See contract drawings.
 - 2. Maximum Allowable Deflection of Planks: $1/240$ of span under total load and $1/360$ of span under live load, cambered to achieve flat surface under dead load.
 - 3. Design components to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.
 - 4. Grouted Keys: Capable of transmitting horizontal shear forces.

1.5 SUBMITTALS

- A. See Section - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate standard component configuration, design loads, deflections, and cambers.
- C. Shop Drawings: Indicate plank locations, unit identification marks, connection details, edge conditions, bearing requirements, support conditions, dimensions, openings, openings intended to be field cut, and relationship to adjacent materials. Shop drawings submitted for structural review shall consist of two (2) sets of prints and one (1) set of reproducibles. Only one (1) marked up set of reproducible with the structural engineer's comments will be returned to the contractor. Contractor shall allow for two weeks of review time for each shop drawing and should schedule all submittals accordingly.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Submit detailed calculations for all planks, openings, keys, & other elements, prepared by a professional engineer licensed in New York State.

- F. Submit estimated cambers for floors slabs receiving cast in place topping.
- G. No fabrication of members shall commence until above requirements have been met and shop drawings have been reviewed favorably.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in New York State.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- C. Erector Qualifications: Company specializing in performing the type of work specified in this section, with minimum 3 years of documented experience.
- D. Welder Qualifications: Qualified within previous 12 months in accordance with AWS B2.1.

1.7 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.
- B. Discuss anchor and weld plate locations, sleeve locations, and cautions regarding cutting or core drilling.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
- B. Mark each member with date of production and final position in structure.
- C. Deliver precast concrete units to project site in such quantities and at such times to assure continuity of installation.
- D. Units shall be a minimum of 28 days old prior to transportation.

1.9 PROJECT CONDITIONS

- A. Coordinate with framing components directly associated with the work of this section. It shall be the manufacturer's responsibility to coordinate, furnish and install all anchors, plates, inserts, clip angles, shims, rebars, and similar items required in connection with the fabrication and erection of precast units.
- B. Coordinate field cut openings with affected section.
- C. Coordinate location of hanger tabs and devices for mechanical and electrical work.
- D. The structural precast concrete manufacturer shall be responsible for full coordination of all architectural, mechanical, electrical, and plumbing details and openings as they affect the design, detailing & erection of the plank.

- E. No on the site castings of precast concrete elements will be permitted. Casting work shall be done indoors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Precast Planks:
 - 1. Old Castle Precast Industries, Inc.

2.2 MATERIALS

- A. Concrete Materials: ACI 301. f'_c minimum @ 28 days = 5,000 psi
- B. Tensioning Steel Tendons: ASTM A 416/A 416M, Grade 270 (1725); seven-wire stranded steel cable; low-relaxation type; full length without splices; uncoated.
- C. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (280) deformed steel bars.
- D. Non-Shrink Grout: Non-metallic, minimum compressive strength of 10,000 psi at 28 days.
- E. Cement Grout: Minimum compressive strength of 3,000 psi at 28 days.
- F. All steel embedment shall conform to ASTM A36.

2.3 ACCESSORIES

- A. Connecting and Supporting Devices: Plates, angles, items cast into concrete, items connected to steel framing members, and inserts: ASTM A 36/A 36M carbon steel; prime painted.
- B. Hanger Tabs: Galvanized steel, designed to fit into grouted key joints, capable of supporting 500 lbs dead load, predrilled to receive hanger.
- C. Elastomeric Bearing Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, minimum tensile strength 2250 psi per ASTM D412.

2.4 FABRICATION

- A. Planks: Plant cast, prestressed, hollow core:
 - 1. Dimensions as indicated on drawings.
- B. Weld reinforcing in accordance with AWS D1.4.
- C. Embed anchors, inserts, plates, angles, and other items at locations indicated.
- D. Provide openings required by other sections, at locations indicated.

- E. Plant Finish: Finish members to PCI MNL-116 Commercial Grade.
- F. Connecting and Supporting Steel Devices: Do not paint surfaces in contact with concrete or surfaces requiring field welding.
- G. Patching: Patching will be acceptable providing the structural adequacy of the hollow core unit is not impaired.
- H. All header members to be supplied by the precast concrete plank manufacturer. The size and arrangement of plank openings are to be submitted to the engineer for review. Where additional reinforcing framing or greater strength plank is required, due to concentrations produced by header framing at plank openings, such additional reinforcing shall be provided subject to the architect's approval, at no additional cost to the owner.
- I. All openings in precast concrete planks shall be made during fabrication. In the event that openings are cut in the field, the precast concrete plank fabricator shall ascertain that the structural integrity of the plank has not been impaired and that the prestressing strands have not been severed.
- J. The grouting and installation of all units shall be in strict conformance to the manufactures specifications.

2.5 FABRICATION TOLERANCES

- A. Conform to PCI MNL-116 and PCI MNL-135.

2.6 SOURCE QUALITY CONTROL AND TESTS

- A. See Section 03300 for testing of concrete and grout, materials, and mix designs.
- B. Produce planks in accordance with requirements of PCI MNL-116. Maintain plant records and quality control program during production of precast planks. Make records available upon request.
- C. Inspect and test stressing tendons before delivery for compliance with specified standards.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and field measurements are as indicated on shop drawings.

3.2 PREPARATION

- A. Prepare support devices for the erection procedure and temporary bracing.
- B. Examine the Contract Drawings and Specifications in order to insure the completeness of the work required under this section. Supplementary work, necessary to complete concrete work though not specifically indicated on the Drawings or specified herein, shall be provided.

3.3 ERECTION

- A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- B. Install bearing pads at bearing ends of planks as indicated.
- C. Align and maintain uniform horizontal and end joints, as erection progresses.
- D. Maintain temporary bracing in place until final connection is made. Protect members from staining.
- E. Adjust differential camber between precast members to tolerance before final attachment.
- F. Adjust differential elevation between precast members to tolerance before final attachment.
- G. Install hanger tabs in joints at 24 inches on center.
- H. Secure units in place. Perform welding in accordance with AWS D1.1.
- I. Tape seal underside of plank joints to prevent grout leakage.
- J. Make plank-to-plank joints smooth using grout, troweled smooth. Transition differential elevation of adjoining planks with grout to a maximum slope of 1:12.
- K. If the "in place" top of plank elevation is not true and level due to differential camber, improper erection, or for any other reason, the contractor shall flash patch as required to provide an acceptable finished surface. The above shall be provided at no additional cost to the owner

3.4 ERECTION TOLERANCES

- A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135.

3.5 PROTECTION OF FINISHED WORK

- A. Protect members from damage caused by field welding or erection operations.

3.6 CLEANING

- A. Clean weld marks, dirt, and blemishes from surface of exposed members.

END OF SECTION

SECTION 035300
CONCRETE TOPPING

PART 1 GENERAL

1.1 DESCRIPTION

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the topping compound as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:

- 1. Topping compound applied over precast concrete hollow core planks.

1.3 RELATED SECTIONS

- A. Precast concrete hollow core planks - Division 3.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in performing the work of this Section with a minimum of 3 years' experience and approved by the manufacturer of the product used.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog information and product data for material to be used.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.7 REGULATORY REQUIREMENTS

- A. Conform to requirements of local codes and ordinances for combustibility or flame spread and fire-resistance characteristics.

1.8 MOCK-UP

- A. Construct a mock-up of underlayment material, 8 feet long by 8 feet wide.
- B. Locate where directed by the Architect.

- C. Approved mock-up may remain as part of the Work.

1.9 JOB REQUIREMENTS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain minimum ambient temperatures of 50 degrees F. for 24 hours before, during, and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture and until underlayment is dry, allow a minimum of 7 days.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Subject to the requirements specified herein, provide "Levelrock 3500" by USG Corporation, or approved equal.

2.2 MATERIALS

- A. Underlayment: Above listed product, or equal.
- B. Water: Potable and not detrimental to underlayment mix materials.
- C. Primer: Manufacturer's recommended type.
- D. Joint and Crack Filler: Latex based.
- E. Top Seal: As recommended by manufacturer.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Mix to achieve following characteristics:
 - 1. Density: 120 lb./cu. ft. minimum dry density.
 - 2. Compressive Strength: 3,500 psi minimum in accordance with ASTM C 472.
 - 3. Fire Hazard Classification: Flame/Smoke rating of 0/0 in accordance with ASTM E 286.
- C. Mix to self-leveling consistency.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where cement leveling compounds are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION

- A. Vacuum clean surfaces.
- B. Prime substrate in accordance with manufacturer's instructions. Allow to dry.
- C. Close floor openings.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Place to minimum 3/8" thickness over highest point on plank.
- C. Immediately spread and screed product to a smooth surface. Spread product utilizing a porcupine roller. Except at authorized joints, place product as continuously as possible until application is complete so that no slurry is placed against product that had obtained initial set.
- D. Apply sealer in accordance with manufacturers recommendations.

3.4 CURING

- A. Air cure in accordance with manufacturer's instructions.

3.5 APPLICATION TOLERANCE

- A. Top Surface: Level to 1/8 inch in 10 ft.
- B. Tolerance for edges at exposed pour stops shall be 1/8" below top of pour stop.

3.6 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over unprotected floor underlayment surfaces and until underlayment is completely dry.

END OF SECTION

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SECTION 042000

UNIT MASONRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the unit masonry work as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
 - 1. Concrete block walls and partitions, including pre-faced concrete masonry units.
 - 2. Metal joint reinforcing, anchors, ties, weeps, closures and related accessories for masonry.
 - 3. Control and expansion joints in masonry, filled with joint fillers.
 - 4. Thru-wall flashing.
 - 5. Mortar net.
 - 6. Chases, recesses, pockets and openings in masonry as required for installation of work by others.
 - 7. Building in of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.
 - 8. Grouting in of metal items built into masonry work.
 - 9. Protection, pointing and cleaning of masonry.

1.3 RELATED SECTIONS

- A. Concrete - Section 033000.
- B. Cold formed metal framing - Section 054000.
- C. Steel lintels - Section 055000.
- D. Building insulation - Section 072100.
- E. Metal flashing - Section 076200.
- F. Firestops and smoke seals - Section 078413.

G. Sealant - Section 079200.

H. Glazed aluminum curtain walls - Section 084413.

1.4 SUBMITTALS

A. Shop Drawings: Submit for:

1. Anchoring details.
2. Control and expansion joint locations and details.
3. Special shapes for pre-faced masonry units.
4. Flashing at typical lintels indicating relationship of flashing to lintel hangers.

B. Samples (Submit the following):

1. Each type of decorative pre-faced masonry unit in specified color(s). Submit certification that decorative units meet ASTM standards specified herein.
 - a. Submit samples of all special shapes required, showing sizes.
2. Joint reinforcing, each type, width and proposed location (labeled).
3. Anchors, wedges and ties, each type, width and proposed location (labeled).
4. Joint filler, each type.
5. Flashing, including splice sample, 12" long.
6. Mortar color, 12" long cured sample.

C. Manufacturer's Literature: Submit technical and installation information for:

1. Mortar materials, each material and mortar type.
2. Certification of mortar mix.
3. Flashing material, descriptive literature.
4. Concrete block, joint reinforcing, anchors, ties and joint filler; submit manufacturer's technical and descriptive literature.
5. Block manufacturer shall submit certifications of compliance with ASTM C 90, C 331 and UL 618 prior to any job site delivery. Field sampling of concrete block may be tested by an Independent Testing Laboratory retained by the Owner according to the requirements of ASTM C 140.

D. Construction Procedures (Submit the following)

1. Procedures and materials for cleaning masonry work; including certification that cleaner will not adversely affect stone, gaskets, sealants, etc.

1.5 QUALITY ASSURANCE

- A. Conform to the following non-cumulative tolerances (any masonry work not meeting these standards shall be re-built as directed by the Architect).

1. Variation from the plumb:

- a. In lines and surfaces of columns, walls and arrises:

1).	In 10 feet	1/8"
2).	In any story of 25 feet maximum	1/4"
3).	In 40 feet or more	1/4"

- b. For external corners, expansion joints and other conspicuous lines:

1).	In any story of 25 feet maximum	1/4"
2).	In 40 feet or more	3/8"

2. Variation from the level or the grades indicated on the drawings; for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:

a.	In any bay or 20 feet maximum	1/4"
b.	In 40 feet or more	1/4"

3. Variation of the linear building lines from established position in plan related portion of columns and partitions:

a.	In any bay or 20 feet maximum	1/4"
b.	In 40 feet or more	1/2"

4. Variation in cross-sectional dimensions of columns and in thickness of walls:

a.	Minus	1/8"
b.	Plus	1/8"

5. Variation in dimensions of masonry openings:

a.	Horizontal dimension	-0" + 1/16"
b.	Vertical dimension	+0" - 1/16"

B. Job Mock-Up

1. Prior to installation of masonry work, erect sample wall panel mock-up using materials, bonding patterns and joint tooling required for final work and including cavity wall, masonry sill, window unit and sill, projecting courses, anchors and reinforcement as detailed. Provide special features as directed by the Architect for caulking and contiguous work. Build mock-up at the site, 4' x 4' size as directed by the Architect, indicating the colors, bonding patterns and workmanship to be expected in the completed work. Reconstruct mock-up if directed by the Architect until it meets with Architect's approval. Obtain Architect's acceptance of visual qualities of the mock-up before start of masonry work. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until work is completed and accepted by the Architect.
2. Approved sample panel shall remain on view at the site until completion of decorative masonry work.

- C. Work of this Section shall conform to the requirements of the following:
1. 2005 ACI 530/ASCE 5/TMS 402 Building Code Requirements for Masonry Structures.
 2. 2005 ACI 530-1/ASCE 6/TMS 602 Specifications for Masonry Structures.
 3. New York City Building Code, including Local Law 17-95 for Seismic Requirements.
- D. Pre-Construction Conference: Prior to installation of masonry and associated work, Contractor shall arrange a meeting with Masonry Subcontractor, installers of related work and other entities concerned with masonry wall performance, including the Architect and Owner. Contractor shall record discussions and agreements and furnish copy to each participant. Provide at least seven (7) days' advance notice to participants prior to convening conference. Review methods and procedures related to masonry work, including but not limited to the following:
1. Review masonry requirements (drawings, specifications and other Contract Documents).
 2. Review required submittals, both completed and yet to be completed.
 3. Review and finalize construction schedule related to masonry work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
 4. Review required inspection, testing, certifying and material usage accounting procedures.
 5. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
- 1.6 PRODUCT HANDLING
- A. General: Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.
- B. Masonry Units: Pack, deliver and store to prevent breakage, cracking, chipping, spalling or other damage. Store, protect and ventilate units at project site.
- C. Aggregate: Store with provisions for good drainage.
- D. Reinforcement and Anchors: Store and protect so that when placed, joint reinforcement and anchors will be free of soil, dirt, ice, loose rust, scale, or other coatings which would destroy or reduce bond with mortar, and will not be disfigured or bent out of shape.

1.7 CODE REQUIREMENTS

- A. Work of this Section shall conform to all applicable requirements of the New York City Building Code.
 - 1. Concrete block shall comply with Reference Standard RS-10.
 - 2. Concrete blocks shall be type approved by the Board of Standards and Appeals.
 - a. Concrete blocks used for fireproofing shall conform to New York City Building Code requirements and shall provide ratings required by the Contract Documents.
- B. Fire rated masonry partitions shall have MEA or BSA number.
- C. Conform to New York City Local Law 17-95 for Seismic Requirements.
- D. Comply with New York City Section 32-05 of Chapter 32 of Title 1 of the Official Compilation of the Rules of the City of New York regarding "Impact Resistant Stair and Elevator Enclosures" when such enclosures are of masonry construction.

1.8 JOB CONDITIONS

- A. In cold weather, when the outside temperature is below forty (40) degrees F., conform to the requirements of "Cold Weather Masonry Construction and Protection Recommendations" publication by the Brick Industry Association (BIA). No anti-freeze admixtures are permitted.
- B. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F. and above.
- C. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24" down both sides and hold cover securely in place.
- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

PART 2 PRODUCTS

2.1 MATERIALS

A. Standard Concrete Block

1. Portland cement, ASTM C 150, Type 1, one source.
2. Aggregates, ASTM C 331, lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process equal to "Solite," "Norlite" or "Haydite."
 - a. All block shall be from one aggregate type and from one manufacturer.
3. Concrete Masonry Units: Load bearing lightweight aggregate concrete masonry units conforming to the requirements of ASTM C 90.
 - a. Block for rated walls shall be solid units.
 - b. All other block shall be hollow units.
4. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL 618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to "National Bureau of Standards" and "National Research Council" full scale fire tests.
5. Sizes and Shapes: Nominal face size 8" x 16" by thickness as indicated on drawings, with stretcher units, jamb units, header units, square corner units (at ends and corners of exposed or painted work), sash units (at control joints within masonry wall), lintel units and other special shapes and sizes required to complete the work.
6. Finish: For exposed or painted block surfaces. In addition to ASTM requirements, block shall have uniformly dense, flat, fine grain texture, with no cracks, chips, spalls, or other defects which would impair appearance. For concealed CMU, surfaces shall be free from deleterious materials that would stain plaster or corrode metal.
7. Curing: All concrete block shall be steam cured, and air dried for not less than thirty (30) days before delivery.
8. Density of concrete block shall not exceed one hundred and five (105) lbs. per cubic foot.
9. Shrinkage: Shrinkage of concrete blocks shall not exceed 0.065% when tested in accordance with ASTM C 426-99.
10. Water Content
 - a. At the time of delivery to the job site, concrete masonry units shall have a value, in weight of contained water, of not more than thirty (30) percent of the fully saturated content for the unit tested.

- b. Ship all units from the factory, and store at the job site, with all necessary protection to prevent increase of water content from rain and other sources.
- B. Pre-Faced Concrete Masonry Units: Provide "Spectra Glaze II" as supplied by Clayton Block Company; lightweight hollow concrete units complying with ASTM C 90, with manufacturer's standard smooth resinous facing complying with ASTM C 744, or equal.
 1. Size: Manufactured to dimensions specified in "Concrete Masonry Units" Paragraph above, but with pre-faced surfaces having 1/16" wide returns of facing to create 1/4" wide mortar joints with modular coursing.
 2. Color:
 - a. Block A: Red One A.
 - b. Block B: Light Forest Gray.
- C. Joint Reinforcing for Masonry Walls
 1. For interior block walls and partitions, provide standard reinforcing fabricated of 9 ga. side and cross rods, truss or ladder design, no ties, spaced every other block course. Provide prefabricated pieces at corners and intersections of walls or partitions. Reinforcing shall be mill galvanized conforming to ASTM A 641, Class B-1, applied after fabrication.
 2. Wire used in assemblies noted above shall be cold drawn steel wire conforming to ASTM A 82.
 3. Approved Joint Reinforcing Manufacturers
 - a. Hohmann & Barnard
 - b. Dur-O-Wal
 - c. Heckmann Building Products
 - d. National Wire Products Industries, Inc.
- D. Anchors and Ties
 1. For anchoring masonry veneer to cold formed metal framing, provide hot dip galvanized steel anchors equal to "X-Seal Veneer Anchor" with "X-Seal Tape" seals as manufactured by Hohmann & Barnard or approved equal. Provide Model 187 "Seismiclip" with 9 ga. wire.
 2. Dovetail Anchor Slots: Galvanized steel equal to No. 305 anchor slot made by Hohmann & Barnard or approved equal by manufacturer noted above.
 3. Flexible Metal Ties for Dovetail Anchor Slots: Galvanized steel, 16 gauge by 1" wide.
 4. Wire Mesh: Galvanized sixteen (16) gauge steel wire, 1/4" square mesh, width 1/2" less than wall thickness, by length to suit condition.
 5. For anchoring masonry to concrete back-up where there are no dovetail slots provided, provide Type NWTC "Pos-I-Tie" zinc cast unit with five (5) gauge hot

dip galvanized steel wire tie made by Heckmann Building Products (ASTM A 153, Class B-1).

6. For anchoring masonry to structural steel, provide hot-dip galvanized steel anchors as listed made by Hohmann & Barnard or approved equal manufacturer noted above. Galvanizing shall conform to ASTM A 153, with zinc coating of 1.5 oz. of zinc per sq. ft.
 - a. No. 355 column anchors.
 - b. No. 356 column anchors.
 - c. No. 357 beam anchors.
 - d. No. 359 F anchor straps with VWT tie.
 7. For anchoring CMU interior partitions to underside of steel beams, provide hot-dip galvanized steel tube anchor equal to No. PTA-420 made by Hohmann & Barnard or approved equal.
 8. For anchoring CMU interior partitions to underside of structural deck, provide 4" x 4" x 1/4" galvanized steel angles (ASTM A 36), 3'-0" long spaced 3'-0" o.c. alternately on each side of partition. Anchor partition securely to structural deck
- E. Reinforcing Bars and Rods: ASTM A 615, Grade 60. See Drawings for size.
- F. Control and Expansion Joint Fillers
1. Vertical Installation Within Concrete Masonry Wall: Extruded high grade neoprene rubber, cross shape, for use with concrete masonry sash units, which shall provide a force fit in the grooves of the sash block, and shall have 1/2" diameter tubular ends (compressed 25% when installed in 3/8" wide joint).
 - a. Provide the following sizes:
 - 1). 2-5/8" wide control joint fillers for 4" block walls.
 - 2). 4-5/8" wide for 6" block walls.
 - 3). 6-5/8" wide for 8", 10" and 12" block walls.
 - b. Provide backer rod and sealant joint over joint filler as per drawings and Section 079200 of these specifications.
 2. Isolation Joint Filler at Abutting Construction and at Intersecting CMU Walls: Compressible and resilient closed cell neoprene gasket with pressure sensitive adhesive backing, thickness 30% greater than thickness of joint. Acceptable joint filler shall be "Everlastic, Type NN-1" by Williams Products, Inc., or approved equal. Recess joint filler and install backer rod and sealant as per drawings and Section 079200 of these specifications.
- G. Neoprene Joint Filler: Provide closed cell neoprene Type NN-1 conforming to ASTM D1056, grade 1, high performance, as manufactured by Williams Products Inc., or equal made by D.S. Brown, Norton or approved equal.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type 1, standard color, one source.

- B. Hydrated Lime: ASTM C 207, Type S, as manufactured by Corsons, or approved equal.
- C. Sand: Clean, washed, buff colored sand, graded per ASTM C 144.
- D. Water: Clean, fresh and suitable for drinking.

2.3 MORTAR MIX

- A. Exterior Masonry Veneer Construction: Mortar mixes shall meet ASTM C 270, Type N, cement/lime mortar. Colors of mortars shall use coloring agent made by Davis Colors, Lehigh Cement or approved equal. Color of mortar to meet with Architect's approval. The Contractor may use pre-packaged colored mortar equal to "Color Mortar Blend" made by Glen-Gery.
 - 1. Color of mortar must meet with Architect's approved sample and mock-up panel.
- B. Interior Masonry Construction: Provide Portland cement/lime mortar conforming to ASTM C 270, Type N, for load bearing conditions, mortar shall conform to ASTM C 270, Type M.
- C. Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of unit masonry. Use grout of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.
- D. Mixing
 - 1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass.
 - 2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.
 - 3. Acceleration or other admixtures not permitted.
 - 4. Mortar shall have a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91.
- E. Admixtures
 - 1. No air-entraining admixtures or cementitious materials containing air-entraining admixtures shall be used in the mortar.
 - 2. No antifreeze compounds or other substances shall be used in the mortar to lower the freezing point.
 - 3. Calcium chloride or admixtures containing calcium chloride shall not be used in mortar.

2.4 WEEP HOLES

- A. Provide clear plastic weep holes 3/8" wide and 1-1/2" high by four (4) inches long equal to No. 342 made by Hohmann & Barnard or approved equal manufacturer listed above.

2.5 THRU-WALL FLASHING

- A. Provide 40 mil EPDM sheet membrane flashing shall be "Pre-Kleened EPDM Thru-Wall Flashing" as manufactured by Carlisle Corp. or approved equal. Provide sealants and tapes as recommended by the manufacturer. Provide preformed corner sections "end dams" with system.

- 1. Provide flashing for surface adhered applications at sheathed areas with stainless steel termination bar.

- B. Acceptable Alternate Flashing: 60 mil uncured neoprene made by Emseal Corp. or American Hydro-Tech or 40 mil Hyload Flashing Membrane made by Hyload Inc.

2.6 MORTAR NET

- A. Provide 10" high HDPE "Mortar Net" open mesh mortar net of width to fit masonry cavity shown on drawings, manufactured by Hohmann & Barnard, or equal "Mortar Maze," made by Advanced Building Products.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

- 1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 2. Verify that masonry may be completed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.
 - 3. Do not start any work until mock-ups are approved by the Architect.

B. Discrepancies

- 1. In the event of discrepancy, immediately notify the Architect in writing.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 COORDINATION

- A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 INSTALLATION

A. General

1. Do not wet concrete block units.
2. Build walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown.
3. Build chases and recesses as shown or required for the work of other trades.
4. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
5. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible.
6. Lay up walls plumb and true with courses level, accurately spaced and coordinated with other work.
7. Pattern Bond: Provide stack bond for all masonry except, at basement Meter Rooms, provide running bond.
8. Where possible, masonry walls and partitions shall be built after all overhead ducts, pipes and conduits are in place and tested. Masonry shall be neatly built around the items above. Walls and partitions shall be plumb, true to line and free from defects such as open cells, voids, dry joints and other similar defects. In rooms and spaces scheduled to have concrete block finish, all such surfaces including upper wall surfaces up to termination of structural ceiling in spaces without suspended ceilings, shall be made suitable for paint application. Cutting of openings in walls and partitions in place shall be done only with the approval of the Architect.

B. Mortar Bedding and Jointing

1. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on exterior walls and in all courses of piers, columns and pilasters, where solid CMU is used and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
2. Lay decorative pre-faced masonry walls with 1/4" joints unless otherwise shown on drawings.
3. Lay all other masonry walls with 3/8" joints unless otherwise shown on drawings.
4. Tool exposed joints slightly concave. Concealed joints shall be struck flush.
5. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

- C. Stopping and Resuming Work: Rake back 1/2 unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built-In Work

1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.
2. Mortar in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.
3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.
4. Sleeves, pipes, ducts and all other items which pass through masonry walls shall be caulked with interior grade sealant meeting requirements of Section 079200, so as to be air tight and prevent air leakage. Refer to Section 078413 for packing of voids in rated masonry walls.
5. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell, including window or curtain wall anchors.
6. Fill vertical cells of masonry units solid with mortar on each side of door frames to sixteen (16) inches beyond.
7. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below steel bearing plates, steel beams, and ends of lintels, to eight (8) inches beyond bearing and from floor to bearing.
8. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.
9. Masonry indicated as being reinforced shall have all voids filled solid with grout. Grout shall be consolidated in place by vibration or other methods which insure complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour shall not exceed twelve (12) inches. When the least clear dimension is two (2) inches or more, maximum height of grout pour shall not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, the grout pour shall be stopped 1-1/2" below the top of a masonry unit. Vertical bar reinforcing shall be accurately placed and held in position while being grouted, and shall be in place before grouting starts. All such reinforcing shall have a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

E. Cutting and Patching

1. All exposed masonry which requires cutting or fitting shall be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.

2. Do not saw cut any masonry openings in pre-faced masonry construction without Architect's approval and after a procedure has been reviewed and approved.
3. Holes made in exposed masonry units for attachment of handrail brackets and similar items shall be neatly drilled to proper size.
4. All masonry which requires patching in exposed work, if approved by Architect, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the Architect's satisfaction. Rake back joints and use pointing mortar to match as required.

F. Solid Wall Construction

1. Fill the vertical longitudinal joint between wythes solidly with mortar by parging the in-place wythe and shoving units into the parging.
2. Tie wythes with continuous horizontal reinforcement embedded in mortar joints sixteen (16) inches o.c. vertically.

G. Interior Block Partitions

1. Build to full height unless otherwise shown on drawings. At non-rated partitions fill void between CMU and structural deck with continuous neoprene filler conforming to the requirements of Paragraph 2.1 G. At fire rated partitions, fill void with fire stop material meeting the requirements of Section 078413. Fasten to structure at top of partition using steel angles as specified herein.
2. Provide continuous horizontal joint reinforcing every other block course, except as otherwise noted. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8". Lap reinforcement a minimum of six (6) inches at ends of units.
3. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
4. Corners
 - a. Provide interlocking masonry unit bond in each course at corners.
 - b. Provide continuity at corners with prefabricated "L" reinforcement units, in addition to masonry bonding.
5. Intersecting and Abutting Walls
 - a. Unless vertical control joints are shown as part of structural frame, provide interlocking masonry bond. Provide starters and special shapes as shown on the drawings to bond these walls.
 - b. In addition to masonry bonding, provide horizontal reinforcement using prefabricated "T" units at interior partitions.

H. Ties and Anchors for Masonry Construction

1. Provide ties and anchors as shown or specified, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and/or vertically. Provide additional ties within 1'-0" of all openings and spaced not more than 24" apart around perimeter of openings.
2. Anchor masonry to structure complying with the following:
 - a. Provide an open space not less than 1/2" in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
3. Attach masonry veneer to cold formed metal framing by anchoring masonry to studs using specified anchors penetrating through sheathing and through flange of stud. Prior to application of anchors cover sheathing and vapor barrier with tape specified herein. Space anchors 8" o.c. at each stud; provide stainless steel screw anchors for attaching anchor to studs.

I. Control and Expansion Joints

1. Provide vertical expansion, control and isolation joints in masonry as shown. Build in related items as the masonry work progresses.
2. CMU Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 20'-0" o.c. In addition, locate joints at points of natural weakness in the masonry work, including the following:
 - a. At structural column or joint between bay.
 - b. Above control joints in the supporting structure.
 - c. Above major openings at end of lintels upward and below at ends of sills downward. Place at one side of jamb for openings not less than 7'-0" wide and at both sides for openings over 6'-0" wide.
 - d. At reduction of wall thickness.
 - e. Where masonry abuts supporting structure.
 - f. If additional joints are required, indicate same on approved shop drawings.
3. Masonry Veneer Expansion Joint Spacing: Vertical expansion joints in masonry veneer construction shall be located maximum 25'-0" o.c. unless otherwise noted in addition to expansion joints located within 2'-0" of each corner of the building.

J. Lintels

1. Install loose steel lintels furnished by Section 055000, allowing eight (8) inch bearing at ends.
2. For concrete block walls, use specially formed U-shaped concrete block lintel units with reinforcing bars in accordance with the following table, filled with grout.

Number and Size of Reinforcing Bars Required at Concrete Block Lintels		
Maximum Clearance Span	Wall Width	Rebar No. - Size
2'-0" to 6'-0" 6'-0" to 8'-0"	6"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	8"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	12"	3 - #3 3 - #4

3.4 FLASHING/WEEP HOLES

- A. General: Install embedded flashing and weep holes in masonry at relieving angles, shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated. Space weeps 16" o.c. unless otherwise shown on drawings.
- B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing.
- C. Flashing shall be placed, generally, at bottoms of cavity wall construction, over all wall openings, window jambs, at sills of window, and in other locations where indicated on the drawings. At bottoms of cavity walls, the flashing shall be built extending from the exterior face of the masonry veneer, up and into the mortar joint 2" at the inner wythe of the concrete back-up; at sheathed areas attached with pressure bar. Extreme care shall be exercised in placing the masonry materials not to damage the flashing. Flashing damaged during the masonry erection shall be repaired or replaced by the Contractor at no additional cost to the Owner. All flashing shall be continuous around building unless otherwise noted on the drawings. Provide flashing of sufficient width to allow flashing to protrude 1" beyond building face.
- D. Where flashing is penetrated by anchors, patch flashings at penetration using adhesive and mastic recommended by the manufacturer to insure watertight seal.
- E. Install flashing in accordance with manufacturer's instructions, using adhesive, primer, thinner, cleaner and mastic as recommended by flashing manufacturer.

3.5 CLEANING, PROTECTION, ADJUSTMENT

- A. Protection
 1. The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter, and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.
 2. Excess mortar shall be wiped off the masonry surfaces as the work progresses.
 3. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.

4. Protective measures shall be performed in a manner satisfactory to the Architect.
 5. Damaged masonry units shall be replaced to satisfaction of the Architect.
 6. Exterior masonry walls shall be draped with waterproof covering until copings are in place, to prevent water penetration in cavity.
- B. Clean-Up: Upon completion, all exposed masonry shall be thoroughly cleaned following recommendations of the BIA Technical Note No. 20. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 4' x 4' in a location approved by the Architect. No further cleaning work may proceed until the sample area has been approved by the Architect, after which time the same cleaning materials and method shall be used on the remaining wall area. If stiff brushes and water do not suffice, the surface shall be thoroughly saturated with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, equal to "Vana Trol" made by ProSoCo Inc. or equal made by Diedrich or approved equal, mixed as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. All lintels and other corrodible parts shall be thoroughly protected during cleaning.
- C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION

SECTION 051223

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide Structural Steel in accordance with the Contract Documents. See architecturally exposed structural steel section for additional requirements.
- B. Work Included: Work of this section shall include, but not be limited to, the following:
 - 1. Structural Steel Work.
 - 2. Architectural Exposed Structural Steel.
 - 3. Bolted And Welded Connections.
 - 4. Stud Shear Connectors.
 - 5. Filler Materials.
 - 6. Items And Accessories Required To Erect Structural Steel Work.
 - 7. Anchor bolts and bearing plates.
 - 8. Shop Applied Coating of Structural Steel.
 - 9. Field Touch-Up Painting of Shop Applied Coatings.
 - 10. Field Parging Of Steel Members Encased In Exterior Masonry Walls.
- C. Related Work Specified Elsewhere:
 - 1. Light Gauge Structural Framing.
 - 2. Miscellaneous Metal Items.
 - 3. Finish Painting of Shop Primed Steel.
 - 4. Metal Decking.
 - 5. Architecturally Exposed Structural Steel.

1.2 QUALITY ASSURANCE

- A. Specifications and Codes: Work shall conform to the following referenced specifications and codes or to the requirements of local authorities having jurisdiction, whichever is more stringent, unless modified by this specification:
 - 1. American Institute of Steel Construction (AISC):
 - a. Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design.
 - b. Load and Resistance Factor Design Specification for Structural Steel Buildings.
 - c. Code of Standard Practice for Steel Buildings and Bridges.
 - d. Standard Specifications and Load Tables for Steel Joists & Joist Girders - SJI.
 - e. Allowable Stress Design Specification for Structural Joints using ASTM A325 or A490 bolts. Approved by the Research Council on Structural Connections of the Engineering Foundation.
 - f. Load and Resistance Factor Design Specification for Structural Joints using ASTM A325 or A490 bolts. Approved by the Research Council on Structural Connections of the Engineering Foundation.
 - 2. American Welding Society (AWS) - Structural Welding Code - Steel, AWS D1.1.
 - 3. Building Code of the City of New York.

B. Applications, Permits, Certificates and Reports:

1. Cranes, derricks and other hoisting equipment when used on this project for any purpose whatsoever shall conform to Rules and Regulations by Department of Buildings, City of New York, covering equipment, the operation thereof and location at site of said cranes or derricks:
 - a. Contractor shall file required applications and secure necessary permits or certificates including Certificate of on Site Inspection. Preparation of required plans, showing crane or derrick locations, to be filed with the application for Certificate of on Site Inspection, as well as pertinent data to be submitted shall be prepared by a Professional Engineer, licensed in the State of New York, hired and paid for by Contractor.
 - b. A copy of applications, plans of crane or derrick locations, and pertinent required data shall be submitted to Architect at time of filing.
 - c. Contractor is cautioned that no equipment is to be moved onto site prior to approval of application by Division of Cranes and Derricks. Any cribbing, sheeting or shoring required by the Division or Building Department shall be installed by Contractor.
 - d. Cost of furnishing equipment as well as application and permit fees, cost of services of the Professional Engineer, any material and labor required to install cribbing, shoring or sheeting shall be paid for by Contractor and included in his bid price.
2. Contractor shall indicate loading on the structure caused by derricks or hoisting equipment. The cost of any reinforcing of the structure and required design as a result of these additional loads shall be paid for by the Contractor. Contractor is fully responsible for safety of hoisting equipment.
3. Joists are restricted to those series which the manufacturer has had approved by the Steel Joist Institute. Joist manufacturers shall submit certification of this approval prior to the submission of shop drawings.
4. Mill Test Reports: Provide Architect with duplicate reports certifying that steel conforms to specifications both as to strength and chemical analysis.
5. Only welders holding a valid Welders License issued by the City of New York will be accepted by the Testing Laboratory as qualified to do welding in the field. Welding in the shop shall only be done by welders who qualify by tests prescribed in AWS D1.1 or who hold certificates indicating qualifications equivalent to AWS.

C. Tolerances:

1. Fabrication tolerances shall be in accordance with Section M2 of Specification for Structural Steel Buildings. Erection tolerances shall be in accordance with Section 7 of the AISC Code of Standard Practice.
2. Stud Shear Connectors: A maximum variation of 1/2 inch from location shown on drawings will be accepted provided adjacent studs are not closer than 2-1/2 inches center to center.

1.3 SUBMITTALS

- A. Shop Drawings: Shop drawings shall be prepared by experienced detailers, with beam and column connections, splices, welding and bolting, conforming to recommendations given in AISC Manual of Steel Construction. In addition, shop drawings shall show in detail, required stiffeners, splice plates, and any supplementary material necessary so that the steel work is complete and conforms to drawings and specifications:

1. Submit to Architect for review, checked erection and detail shop drawings, schedules and index sheets. Erection plans and column schedules shall be drawn to scale of at least 1/8 inch per foot, with sections, details and standards drawn to larger scale. All dimensions on shop drawings shall be coordinated by the Contractor based on field conditions. Shop drawings for structural review shall consist of (2) sets of prints and (1) set of reproducibles. Only (1) marked up set of reproducibles with the structural engineer's comments will be returned to the contractor.
 2. Provide setting drawings, templates and directions for installation of anchor bolts and other anchorages to be installed by other trades, to Contractor.
 3. Upon completion of work and at no additional cost to Owner, make legible reproductions of erection plans and column schedules. These reproductions together with original drawings of shop details, schedules and index sheets, shall become property of Architect.
 4. Shop drawings will be reviewed for size of material and strength of connection by the Engineer of Record, which shall not render the Engineer responsible for any errors in construction dimensions, etc. which shall have been made in preparation of shop drawings. The Contractor shall assume full responsibility for the correctness of dimensions and fit.
 5. Calculations shall be submitted upon request.
- B. Product Data: Submit copies of manufacturer's latest published literature for approval and obtain approval prior to start of fabrication. Literature shall include the following:
1. Shop paint primer materials.
 2. Proprietary bolts, fasteners.
 3. Stud shear connectors.
- C. Cranes, Derricks and Hoisting Equipment:
1. If building frame has to be reinforced to support rigging equipment and loads, shop drawings for reinforcing and/or additional steel required for hoisting shall be submitted to Architect for approval before any operations are started in field. Shop drawings shall indicate equipment and loading applied to building frame and must be prepared, signed and sealed by a licensed Professional Engineer registered in the State of New York.

1.4 DELIVERY STORAGE AND HANDLING

- A. Deliver materials specified herein, with manufacturer's name and point of origin, labeled or tagged on materials with each delivery.
- B. Protect materials from detrimental conditions.

1.5 PROJECT CONDITIONS

- A. Protect work in progress from weather and damage. Work damaged shall be removed and replaced when so directed by the Architect at the Contractor's cost.

1.6 TESTING AND INSPECTION

- A. The material to be furnished under this specification shall be subject to inspection and testing. Shop and field inspection will be performed by the independent Inspection and Testing Agency. The Contractor shall notify the Architect in writing one week in advance of the start of shop fabrication and one week in advance of the start of field erection. The Contractor shall supply the Inspection and Testing Agency with copies of all shop details and all necessary information relating thereto.

- B. Inspection and acceptance or failure to inspect shall in no way relieve the Contractor from his responsibility to furnish satisfactory material strictly in accordance with Contract Plans and Specifications.
- C. The Inspection and Testing Agency shall conduct and interpret tests and state in each report whether the test specimens comply with the requirements of the governing Codes and Specifications and specifically state any deviation therefrom.
- D. Provide access for the Inspection and Testing Agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
- E. The Inspection and Testing Agency may inspect structural steel at the plant before shipment; however, the Architect reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
- F. Shop inspection shall include the identification of tested material, the checking of all fabrication for compliance with approved shop drawings and these specifications, and inspection of shop painting as well as the following:
 - 1. Shop Welding: Inspect and test during fabrication of structural steel assemblies as follows:
 - a. Certify welders and conduct inspections and tests as required. Record types and locations of all defects found in the work. Record work required and performed to correct deficiencies.
 - b. Perform visual inspection of all welds.
 - c. Perform the following (in addition to visual inspection):
 - (1) Magnetic Particle Testing: ASTM E109. 20% of all fillet welds.
 - (2) Ultrasonic Inspection: ASTM E164. All full penetration welds shall be tested by ultrasonic method.
 - (3) See structural drawings for specific testing requirements.
- G. Field inspection shall include the inspection after delivery at the site of all material, fabrication and shop paint and all work connected with the erection and field painting of the steel structure, as well as the following:
 - 1. Field-Bolted Connections: Inspection in accordance with AISC Specifications for "Structural Joints Using ASTM A325 or A490 Bolts".
 - 2. Field Welding: Inspect and test during erection of structural steel as follows:
 - a. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in the work. Record work required and performed to correct deficiencies.
 - b. Perform visual inspection of all welds.
 - c. Perform the following:
 - (1) Magnetic Particle Testing: Perform as in F.1.c (1) above, for all field welds.
 - (2) Ultrasonic Inspection: Perform as in F.1.c (2) above, for all field welds.
 - (3) See structural drawing for specific testing requirements.
- H. Records and Reports: Inspector shall keep adequate daily records of the progress of the work, of difficulties experienced, of acceptance and rejection of work inspected. Submit daily typewritten reports for each day's inspection work at fabrication shop or site. Include on final inspection report a resume of total tonnage inspected:

1. Names of inspectors and time of arrival and departure at plant or site shall appear on reports.
 2. Reports shall be submitted daily as follows: Two (2) copies shall be forwarded to Architect's home office, one (1) copy to Owner's field representative at job, one (1) copy to Contractor and one (1) copy to Owner.
 3. After completion of work, furnish notarized affidavit in triplicate to Architect that welding and/or high strength bolt installations have been inspected and conform with specifications and Building Code requirements of local authorities. Secure copy of form to be used from Architect.
 4. Also forward one (1) copy to Borough Superintendent of the New York City Building Department in appropriate borough.
- I. The Contractor shall correct deficiencies in the structural steel work which inspection and laboratory test reports have indicated to be not in compliance with requirements. Testing Agency shall perform additional tests, at Contractor's expense, as may be necessary to re-confirm any non-compliance work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel (Rolled Shapes): ASTM A992, Gr. 50, unless otherwise shown:
1. The Contractor shall submit a guarantee in writing that steel is equivalent to that specified. Include tests or specifications.
- B. Structural Steel (Channels, Angles and Plates): ASTM A36, unless otherwise shown:
1. The Contractor shall submit a guarantee in writing that steel is equivalent to that specified. Include tests or specifications.
- C. Steel Pipe: ASTM A53 Grade B.
- D. Cold-Formed Welded and Seamless Carbon Steel Structural Tubing: ASTM A500, Grade B.
- E. Bolts: Provide bolts of 3/4 inch diameter, minimum:
1. High Strength Bolts, Nuts and Washers: ASTM A325 and ASTM A490.
 2. Anchor Bolts: ASTM A307 or A36, unless otherwise noted on drawings.
 3. Rough Bolts: ASTM A307.
 4. Anchor Rods: ASTM F1554.
- F. Filler Material: Electrodes shall be of AWS Specification Classification Number E70 Series, and low hydrogen for field welding to existing steel.
- G. Applied Coatings: Provide a complete system of steel primers, specifically formulated for steel:
1. All interior steel shall be painted with the following system by Tnemec or equal:

Surface Prep:	SSPC-SP2 Hand Tool Clean
Prime:	10-99 or 4 Versare, 2-3 mils dft
Intermediate:	1029 Enduratone, 2-3 mils dft
Finish:	1028 Euduratone, 2-3 mils dft

2. All exterior steel shall be painted with the following system by Tnemec or equal:

Surface Prep:	SSPC-SP3 Power Tool Clean
Prime:	10-99 or 4 Versare, 2-3 mils dft
Intermediate:	1029 Enduratone, 2-3 mils dft
Finish:	1028 Enduratone, 2-3 mils dft
Field Touch up:	Use 115 Rust Acrylic Inhibitor Spot Primer
 3. Milled Surfaces: Hot mixture of 4 lbs. tallow, 2 lbs. white lead and 1 qt. linseed oil, or a mixture of 85% Chinese wood oil varnish in oil, 2% Chinese (or Prussian) blue in oil and 13% dryer (lacquer).
 4. Parging: Provide one of the following fibrated bituminous mastics:
 - a. Trowel Mastic 10-23 by Monsey Products Co.
 - b. Dehydratine 6 Mastic by Building Prods. Div. - W.R. Grace & Co.
 - c. Hydrocide Mastic by Sonneborn Building Products
 5. High Performance Primer: Shop applied rust Inhibitive catalyzed epoxy primer for steel and miscellaneous support members. One of the following or approved equal:
 - a. "Chembuild, Series 135" (Tnemec Co. Inc.)
 6. For Architecturally Exposed Structural Steel see Section 51225.
- H. Shear Stud Connectors: Shall be formed from cold finished carbon steel conforming to ASTM Designation A108, Grade Designation 1015-1020, and having the following mechanical properties:
1. Tensile Strength: 60,000 psi min.
 2. Yield Strength: 50,000 psi min.
 3. Elongation (2 inches): 20 percent minimum.
 4. Reduction of Area: 55 percent minimum.
 5. The following stud connectors are approved for use:
 - a. KSM-Headed Shear Connectors (Arc) - KSM Division Omark Industries, Inc., Moorestown, N.J.
 - b. Nelson Stud Shear Connectors - Nelson Stud Welding, Inc. A United-Carr Division of TRW, Inc., Elyria, Ohio.
- I. Non-Metallic Shrinkage-Resistant Grout:
1. Grout shall be non-shrink, made from factory premixed material containing no corrosive irons, aluminum, or gypsums. The following products are approved for use:
 - a. "Five Star Grout" by U.S. Grout Corp.
 - b. SikaGrout 212 by Sika Group

2.2 FABRICATION

- A. Mill column and bearing stiffeners to give full bearing over the cross section. Mill contact surfaces of bearing and base plates. It is not necessary to plane bottom surfaces of plates on grout beds.
- B. Drill or punch holes at right angles to the surface of the metal, not more than 1/16 in. larger than the connector diameter. Do not make or enlarge holes by burning. Drill material

having a thickness in excess of the connector diameter and material thicker than 7/8 in. Holes shall be clean-cut without torn or ragged edges. Remove outside burrs resulting from drilling operations.

- C. Provide holes in members to permit connection of the work of other trades. Use suitable templates for proper location of these holes. Steel requiring adjustment shall be provided with slotted holes as shown.
- D. Provide holes, slots and openings required by other trades together with necessary reinforcing as shown. Use suitable templates for proper location of these openings. Where openings are shown on the Drawings or shop drawings no change in location will be permitted without prior approval.
- E. Manual oxygen cutting shall be done only with a mechanically guided torch. An unguided torch may be used provided the cut is within 1/8 in. of the required line.
- F. Do not use an unguided torch on architecturally exposed steel.
- G. Architecturally exposed structural steel members including built-up members shall conform to the tolerance requirements specified in "Specifications for Architecturally Exposed Structural Steel". Correct damaged members to meet the above referenced specification. Grind abrasions and other defects where finished appearance will be affected.
- H. Fill dents in non-weathering architecturally exposed structural steel with metallic filler and grind flush and smooth.

2.3 SURFACE PREPARATION FOR APPLIED FINISHES

- A. Clean all surfaces not otherwise specified in accordance with SSPC Surface Preparation Specification No. 1 Solvent Cleaning followed by No. 2 Hand Tool Cleaning, unless more stringent requirements are required by the coating manufacturer or unless otherwise indicated.
- B. Clean Architecturally Exposed Steel as indicated in Section 051225.
- C. Cleaning shall be done after fabrication and immediately prior to shop painting or shipment. Apply shop coat of paint within 4 hours after cleaning and before rust-bloom occurs.
- D. Blast cleaning operations shall not be conducted when the relative humidity of the air is greater than 85% or when the surface temperature of the steel is less than 5 deg. F. above the temperature at which condensation will occur, or when these conditions are anticipated. Remove all traces of blast residue and dust in a manner that will not contaminate the surfaces. Take every precaution to prevent contamination of surfaces. Workmen shall wear gloves free of grease and/or oil when handling blast cleaned steel.

2.4 SHOP APPLIED COATINGS

- A. All structural steel shall receive a shop coat of coating except as follows:
 - 1. Members encased in concrete.
 - 2. Contact surfaces of welded connections and areas within 2 in. of field welds.
 - 3. Contact surfaces of high-strength bolted connections.
 - 4. Surfaces receiving sprayed-on fireproofing, unless otherwise noted.
 - 5. Surfaces receiving stud shear connectors.
- B. Treat milled surfaces with mixture specified hereinbefore.

- C. Parge steel to be encased in masonry in accordance with coating manufacturers requirements.
- D. Apply specified primers and coatings to provide a minimum dry film thickness of 2.0 mils, except for milled surfaces, unless more stringent. No painting shall be done when the surface temperature of the steel is below the temperature at which condensation will occur. Apply paint thoroughly and evenly to dry surfaces in accordance with manufacturer's directions.
- E. Provide packing and dunnage to prevent damage to coated surfaces during handling and erection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions at the job site where work of this Section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.
- B. Verification of Existing Conditions:
 - 1. Check carefully existing conditions and dimensions to insure proper location of structural steel work.

3.2 PREPARATION

- A. Examine the Contract Drawings and specifications in order to insure the completeness of the work required under this Section.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, so as not to delay job progress.
- C. Preparation of Surfaces:
 - 1. Stud shear connectors shall be free of rust, scale and oil at time of welding. Steel surface to which studs are to be welded shall be cleaned of mill scale, rust, dirt, paint, grease or any material which may reduce strength of weld.

3.3 INSTALLATION/APPLICATION/PERFORMANCE REQUIREMENTS

- A. Workmanship:
 - 1. Fabrication: Fabricate steel in accordance with AISC Specifications and as indicated on approved shop drawings. Mill bearing ends of columns and struts to true surface, at right angles to axis, to insure full uniform bearing. Saw cutting will not be accepted.
 - 2. Connections:
 - a. Moment connections of beams and girders to columns unless otherwise shown shall be Type 3 as defined in Section A2.2 of the AISC Specification for Steel Buildings and of capacity as specified herein and/or as detailed on drawings.

- b. Use seated connections in lieu of one-sided connections wherever possible. Where one-sided connections are necessary, submit detail to Architect for approval prior to issuance of shop drawings.
- c. Beam seats and stiffeners shall be clipped to remain within fireproofing of columns or beams.

3. Erection:

- a. Provide temporary shoring and bracing as required, with members and connections capable of sustaining imposed loads. Provide temporary guy lines to obtain proper alignment during erection.
- b. Make provisions for controlling sag or deflection in cantilever members, including canopies and marquees (by shoring or cambering), to insure that outer ends of such members shall be at elevations shown.
- c. Lintels fastened to or hung from structural steel shall be furnished with adjustable connections in vertical and horizontal directions. Set lintels to required level and alignment. Coordinate and perform such work in conjunction with other trades. After final adjustment, weld slotted connections permanently in place.
- d. Provide beams resting on walls with government anchors, web clip angles or other approved anchors, if not otherwise shown.
- e. Provide temporary planking and working platforms as required.
- f. Employ a Licensed Professional Engineer or Land Surveyor to ensure accurate erection of the steel.
- g. Do not alter or cut structural members without approval of the Engineer of Record.

4. Cleaning: Clean the following surfaces thoroughly after erection:

- a. Top flange of beams receiving stud shear connectors, or metal deck.
- b. Contact surfaces of joints to be assembled with slip critical type high strength bolts. Such surfaces shall also be free of dirt, oil, loose scale, burrs and other defects.
- c. Surfaces within 2 inches of field welds, and surfaces which have been machine finished. Protect such surfaces to provide suitable substrates to receive touch-up coatings as specified.
- d. Structural steel to be encased in concrete shall be cleaned of any accumulated rust or dirt, field welding slag deposits or other material affecting bond between steel and concrete.

5. Galvanizing: Galvanized material shall be hot dipped in accordance with ASTM A123. Units permanently assembled in shop by welding shall be galvanized after assembly. Prepare assembled units, prior to galvanizing, in accordance with ASTM A385.

B. Anchor Bolts:

- 1. Furnish to the concrete and brick masons anchor bolts and other connectors required for securing structural steel to the foundation and other in place concrete work, together with instructions, templates, etc. necessary for setting them.
- 2. Tighten anchor bolts after support members have been positioned and plumbed. Cut off protruding edges of wedges or shims flush with edge of base of bearing plate prior to packing with grout.

C. Base and Bearing Plates:

1. Clean concrete and masonry bearing surfaces of loose and bond-reducing materials.
2. Set loose and attached base plates and bearing plates for structural members on shims and other adjusting devices.
3. Pack non-shrink grout solidly between surfaces and bases or plates to ensure that no voids remain.

D. Field and Shop Connections:

1. Double Angle Framed Beam Connections, as listed in Tables II, III and IV of AISC Manual of Steel Construction shall be used throughout unless otherwise shown or required.
2. Each connection shall be capable of supporting a load equal to the uniform load capacity of the beam or girder it carries, unless otherwise shown.
3. For composite steel beams (stud shear connectors), connections shall be designed for a load equal to the uniform load capacity of the beam, unless otherwise shown.
4. Shop and field connections for the following shall be made with high strength bolts or welds. Bolted connections shall be bolted A325 slip critical bolts:
 - a. Connections to columns.
 - b. Column splices.
 - c. Moment connections.
 - d. Connections around elevator shafts at floors.
 - e. Connections for elevator machine platforms.
 - f. Connections for support of monorails and/or vibrating equipment, including AC roof units.
 - g. Connections for support of cooling towers.
5. Other shop and field connections shall be welded or bolted with rough bolts.
6. Bolts for connecting galvanized steel to plain steel shall be galvanized in accordance with ASTM A153. Nuts in contact with non-galvanized steel may be plain finished.
7. Install high strength bolts to the required tension by either the calibrated wrench method, turn-of-nut method or use of a direct tension indicator. Place a hardened steel washer under nuts or bolt heads, whichever is the turned element. Regardless of method used, furnish a Skidmore-Wilhelm wrench calibrator and a torque wrench, both in good condition for use by steel inspector. Wrenches used by erector shall be calibrated daily as called for under Structural Steel Inspection.
8. Install bolts in accordance with the Administrative Building Code of the City of New York except as herein modified.
9. Remove erection bolts after welding architecturally exposed structural steel and fill holes by plug welding.

E. Welding Requirements:

1. Design and execute welding in accordance with the American Welding Society "Structural Welding Code - Steel" AWS D1.1, and the Administrative Building Code of the City of New York. In case of conflict, latter shall govern. Welding shall be done by electric arc method with covered electrodes.

F. Connections to Existing Steel: Provide welded connections of new steel to existing steel, unless otherwise detailed or directed.

H. Shear Stud Connectors:

1. Shear stud connectors shall be shop or field welded at Contractor's option by arc-welding process. Arc shields shall be provided on studs and welding done with

appropriate welding gun and related equipment in accordance with manufacturer's recommendations.

2. Studs shall be installed only by an approved applicator franchised by the manufacturer.
3. Prior to start of work, advise the Architect as to what type of welding equipment will be used for installing studs. Certain types of machines, including sidewalk equipment with leads running into the building may or may not be permitted. No work shall start until approval of equipment is received.

3.4 FIELD PAINTING

- A. Field painting shall comply with the requirements specified in Part 2 - Paragraph, "Shop Applied Coatings".
- B. After erection, clean exposed surfaces of field connections, unpainted areas adjacent to field connections and damaged areas in the shop coat to the same standards as required for the shop coat and paint with the same primer used in the shop coat.
- C. Where galvanized coating has been damaged in storage, transit or during erection, clean damaged areas as directed by paint manufacturer and apply two (2) coats of specified primer.
- D. After erection, parge surfaces of structural steel within 8 inches of exterior face of wall, when steel is to be encased in exterior masonry construction. Trowel on to a thickness of not less than 1/8 inch.

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SECTION 051225

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to the Section.

1.2 SUMMARY

- A. This Section includes requirements regarding the appearance and surface preparation of Architecturally Exposed Structural Steel (AESS). Refer to division 5 section 'Structural Steel' for all other requirements regarding steel work not included in this section.

This section applies to any members noted or shown in sections, plans and details on Architectural drawings as AESS and in the areas defined as AESS below.

- B. Related work specified elsewhere:

1. Structural steel work.
2. Metal decking.
3. Metal fabrications.
4. Special coating.
5. Painting.

1.3 SUBMITTALS

- A. General: Submit each item below according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.
- C. Shop Drawings detailing fabrication of AESS components:
 1. Provide erection drawings clearly indicating which members are considered as AESS members.
 2. Include details that clearly identify all of the requirements listed in sections 2.3 "Fabrication " and 3.3 "Erection" of this specification. Provide connections for exposed AESS consistent with concepts shown on the architectural or structural drawings.
 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined herein.
 4. Indicate type, size, finish and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tensioned shear/bearing connections. Indicate which direction bolt heads should be oriented.
 5. Clearly indicate which surfaces or edges are exposed and what class of surface preparation is being used.
 6. Indicate special tolerances and erection requirements as noted on the drawings or defined herein.

7. Conform with additional submittal requirements indicated in the structural steel specifications.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: In addition to those qualifications listed in Division 5 Section 'Structural Steel', engage a firm experienced in fabricating AESS similar to that indicated for this Project with a record of successful in-service performance, as well as sufficient production capacity to fabricate AESS without delaying the Work.
- B. Erector Qualifications: In addition to those qualifications listed in Division 5 Section 'Structural Steel', engage an experienced Erector who has completed AESS work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- C. Comply with applicable provisions of the following specifications and documents:
result of these additional loads shall be paid for by the Contractor. Contractor is fully responsible for safety of hoisting equipment:

1. AISC "Code of Standard Practice," latest edition, Section 10 as amended herein.

Mockups: At least 4 weeks prior to fabricating AESS, the contractor shall construct mockups to demonstrate aesthetic effects as well as qualities of materials and execution. A mockup for each of the following elements shall be constructed: The fabricator will build two full size 'T' and 'K' joint representative of the tubular (rectangular HSS) truss frames (four total pieces). The mock up shall demonstrate weld quality, contouring of the welds at the aligned walls of the members. Provide one sample unpainted after surface preparation and one with the finish coat of paint described in Division 9. HSS members shall extend at least 6" from the joint in the mock-ups.

Build mockups to comply with the following requirements, using materials indicated for final unit of Work:

1. Locate mockups on-site or in the fabricator's shop as directed by Architect. Mockups shall be full size pieces unless the Architect approves smaller models.
 2. Notify the Architect one week in advance of the dates and times when mockups will be available for review.
 3. Demonstrate the proposed range of aesthetic effects regarding each element listed under the fabrication heading below.
 4. Mockup will have finished surface (including surface preparation and paint system).
 5. Obtain Architect's approval of mockups before starting fabrication of final units.
 6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed work:
 - a. Approved mockups in an undisturbed condition at the time of Substantial completion may become part of the completed work.
- D. Pre-installation Conference: The General Contractor shall schedule and conduct conference at the project site to comply with requirements of Division 1. " As a minimum, the meeting shall include the General Contractor, Fabricator, Erector, the finish-painting subcontractor, and the Architect. Coordinate requirements for shipping, special handling, attachment of safety cables and temporary erection bracing, touch up painting and other requirements for AESS.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver AESS to Project site in such quantities and at such times to ensure continuity of installation.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. Use special care in handling to prevent twisting or warping of AESS members.
- C. Erect pre-painted finish pieces using padded slings or other methods such that they are not damaged. Provide padding as required to protect while rigging and aligning member's frames. Weld tabs for temporary bracing and safety cabling only at points concealed from view in the completed structure or where approved by the Architect during the pre-installation meeting. Methods of removing temporary erection devices and finishing the AESS members shall be approved by the Architect prior to erection.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Where AESS is indicated to fit against walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

1.7 COORDINATION

- A. Coordinate installation of anchors for AESS members that connect to the work of other trades. Furnish setting drawings, templates, and directions for installing anchors, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the project site in time for installation. Anchorage concepts shall be as indicated on drawings and approved on final shop drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Meet requirements Division 5 Section 'Structural Steel' as amended below.
- B. High-Strength Bolts, Nuts, and Washers: Per section 051223 heavy hex heads and nuts [Provide rounded bolt heads with twist off bolts]. Provide standard carbon steel finish.

2.2 PRIMERS

Coordinate final primer with project architect and final painting requirements.

FINISHES

- A. Compatibility: The General Contractor shall submit all components/procedures of the paint system for AESS as a single coordinated submittal. As a minimum identify required surface preparation, primer, intermediate coat (if applicable) and finish coat. All of the items shall be coordinated with the finish coat specified in division 9.

- B. Primer shall comply with all federal and local standards for VOC, lead and chromate levels

2.3 FABRICATION

- A. Fabricate and assemble AESS in the shop to the greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by the Architect. Detail AESS assemblies to minimize field handling and expedite erection.
- B. Fabricate AESS with exposed surfaces smooth, square and of surface quality consistent with the approved mock up. Use special care in handling and shipping of AESS both before and after shop painting.
- C. In addition to special care used to handle and fabricate AESS, employ the following fabrication techniques:
 - 1. Fabrication Tolerance: Fabricate steel to one half the normal tolerance as specified in the Code of Standard Practice section 10.
 - 2. Welds ground smooth: Fabricator shall grind welds of AESS smooth. For groove welds, the weld shall be made flush to the surfaces each side and be within $+ 1/16"$, $- 0"$ of plate thickness.
 - 3. Contouring and blending of welds: Where fillet welds are indicated to be ground contoured, or blended, oversize welds as required and grind to provide a smooth transition and match profile on approved mock-up.
 - 4. Continuous Welds: Where welding is noted on the drawings, provide continuous welds of a uniform size and profile.
 - 5. Minimize Weld Show Through: At locations where welding on the far side of an exposed connection occurs, grind distortion and marking of the steel to a smooth profile with adjacent material.
 - 6. Coping and Blocking Tolerance: Maintain a uniform gap of $1/8" \pm 1/32$ at all copes and blocks.
 - 7. Joint Gap Tolerance: Maintain a uniform gap of $1/8" \pm 1/32$.
 - 8. Piece Marks Hidden: Fabricate such that piece marks are fully hidden in the final structure or made with such media to permit full removal after erection.
 - 10. Mill Mark Removal: Fabricator shall deliver steel with no mill marks (stenciled, stamped, raised etc) in exposed locations. Mill marks shall be omitted by cutting of mill material to appropriate lengths where possible. Where not possible, the fabricator may fill and/or grind to a surface finish consistent with the approved mock up.
 - 11. Grinding of sheared edges: Fabricator shall grind all edges of sheared, punched or flame cut steel to match approved mockup.
 - 12. Rolled Members: Member specified to be rolled to a final curved shape shall be fully shaped in the shop and tied during shipping to prevent stress relieving. Distortion of the web or stem and of outstanding flanges or legs of angles shall be visibly acceptable to the Architect from a distance (determined by architect) under any lighting condition determined by the Architect. Tolerances for the vertical and horizontal walls of rectangular HSS members after rolling shall be the specified dimension $\pm 1/2"$.
 - 13. Seal Welds: Seal weld open ends of round and rectangular hollow structural section with $3/8"$ closure plates. Provide continuous, sealed welds at angle to gusset plate connections and similar locations where AESS is exposed to weather.

2.4 SHOP CONNECTIONS

- A. Bolted Connections: Make in accordance with Section 051223. Provide bolt type and finish as noted herein and align bolt heads as indicated on the approved shop erection drawings.
- B. Weld Connections: Comply with AWS D1.1 and Section 051223. Appearance and quality of welds shall be consistent with the mock up. Assemble and weld built-up sections by methods that will maintain alignment of members without warp exceeding the tolerance of this section.

2.5 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections, if primer does not meet the specified AISC slip coefficient.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC Specifications as follows:
 - 1. SSPC-SP 6 "Commercial Blast Cleaning." It is also required where polyurethane finish coats will be used over the primer.)
 - 2. Coordinate the required blast profile with the approved paint submittal prior to beginning surface preparation.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces:
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

2.6 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to AESS indicated for galvanizing according to ASTM A 123. Fabricate such that all connections of assemblies are made in the field with bolted connections. Provide galvanized finish on members and assemblies within the range of color and surface textures presented in the mock ups.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. The erector shall check all AESS members upon delivery for twist, kinks, gouges or other imperfections which may result in rejection of the appearance of the member. Coordinate remedial action with fabricator prior to erecting steel.

3.2 PREPARATION

- A. Provide connections for temporary shoring, bracing and supports only where noted on the approved shop drawings. Temporary connections not shown shall be made at locations not exposed to view in the final structure or as approved by the Architect. Handle, lift and align pieces using padded slings and/or other protection required to maintain the appearance of the AESS through the process of erection.

3.3 ERECTION

- A. Set AESS accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

- B. In addition to the special care used to handle and erect AESS, employ the following erection techniques:
 - 1. AESS Erection tolerances: Erection tolerances shall meet the requirements of standard frame tolerances for structural steel per Chapter 7 of the AISC "Code of Standard Practice.
 - 2. Filling of weld access holes: Where holes must be cut in the web at the intersection with flanges on W shapes and structural tees to permit field welding of the flanges, they shall be filled. Filling shall be executed with proper procedures to minimize restraint and address thermal stresses in group 4 and 5 shapes.
- C. Field Welding: Weld profile, quality, and finish shall be consistent with mock-ups approved prior to fabrication.
- D. Splice members only where indicated.
- E. Obtain permission for any torch cutting or field fabrication from the Architect. Finish sections thermally cut during erection to a surface appearance consistent with the mock up.
- F. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts. Replace connection plates that are misaligned where holes cannot be aligned with acceptable final appearance.

3.4 FIELD CONNECTIONS

- A. Bolted Connections: Install bolts of the specified type and finish in accordance with Division 5 section "Structural Steel".
- B. Welded Connections: Comply with AWS D1.1 for procedures, and appearance. Refer to Division 5 section "Structural Steel" for other requirements.
- C. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp. Verify that weld sizes, fabrication sequence, and equipment used for AESS will limit distortions to allowable tolerances.
- D. Obtain Architects approval for appearance of welds in repaired or field modified work.

3.5 FIELD QUALITY CONTROL

- A. Structural requirements: The Owner will engage an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports. Refer to Division 5 section "Structural Steel" for detailed bolt and weld testing requirements.
- B. AESS acceptance: The Architect shall observe the AESS steel in place and determine acceptability based on the mockup. The Testing Agency shall have no responsibility for enforcing the requirements of this section.

3.6 ADJUSTING AND CLEANING

- A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint shall be completed to blend with the adjacent surfaces of

AESS. Such touch up work shall be done in accordance with manufacturer's instructions as specified in Division 9, Section "Painting."

- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

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SECTION 053100

METAL DECKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, equipment and services, and perform operations required for installation of Metal Decks and related work as indicated on the drawings and specified herein.
- B. Work Included: The work of this section shall include, but not be limited to, the following:
 - 1. Cold-formed metal deck as indicated on drawings and as specified herein.
 - 2. Flashing saddles, sumps, closure members, and cover plates at edges, ends and intersection.
 - 3. Continuous metal screed at edges around the building perimeter, around openings, and as required to prevent leakage of concrete.
 - 4. Metal flashing and closure plates around columns and around the work of other trades which penetrate the deck.
 - 5. Cutting and forming of holes and openings through metal deck, including the reinforcing of deck to support safely both temporary and permanent construction.
 - 6. Supports and/or shoring for metal deck not shown or specified or provided under other sections of this Specification, but necessary for the proper, rigid and safe support of metal deck and of load imposed thereon.
 - 7. Touchup painting in field.
 - 8. Hanger systems.
- C. Related Work Specified Elsewhere:
 - 1. Concrete.
 - 2. Structural Steel.
 - 3. Architecturally Exposed Structural Steel.
 - 4. Miscellaneous Metal.
 - 5. Acoustical Treatment.
 - 6. Mechanical Work.
 - 7. Electrical Work.

1.2 QUALITY ASSURANCE

- A. Specifications and Codes: Work shall conform to the following referenced specifications and codes or requirements of local authorities having jurisdiction, whichever is more stringent.
 - 1. American Iron and Steel Institute - Cold-Formed Steel Design Manual; Specification for the Design of Cold-Formed Steel Structural Members.
 - 2. Steel Deck Institute - Design Manual for composite decks, form decks and roof decks.
 - 3. American Welding Society - Structural Welding Code.
 - 4. New York City Administrative Building Code.
 - 5. Design of decking shall be in accordance with AISI Specification for the Design of Cold-Formed Steel Structural Members. Maximum fiber stress in bending, 33,000 psi except where otherwise specified.

B. Certificates, Licenses and Approvals:

1. Submit certification in triplicate from the manufacturer, attesting that metal deck units meet specifications.
2. Only welders holding valid certificates of qualification or welding licenses from the New York City Department of Buildings will be permitted to do welding and will be accepted by the Testing Laboratory. Neither the Owner nor the Architect will bear any costs involved in qualifying welders.
3. Floor units shall meet requirements of Underwriters' Laboratories and shall carry the Laboratories label of approval.
4. Hanger system must be approved by Board of Standards & Appeals for use in New York City.

1.3 SUBMITTALS

- A. Product Data: Submit copies of manufacturer's latest published literature for materials specified herein for approval and obtain approval before materials are fabricated and delivered to the site.
- B. Certificates: When requested submit certificates attesting to compliance with these specifications for approval. Obtain approval prior to fabrication and shipment of materials.
- C. Shop Drawings:
1. Prepare clear, precise tracings, drawn to scale of 1/8 inch equals 1 foot or larger, indicating units in plan, and show required details at larger scale. Describe fully the proposed installation procedure and welding to be done.
 2. Where stud shear connectors are specified, prepare drawings showing stud layout details and sections.
 3. Submit details of hanger system tabs for approval, and show locations on shop drawing.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials specified herein, with manufacturer's name and point of origin, labeled or tagged on materials with each delivery.
- B. Protect materials from contact with earth and protect from detrimental conditions.

1.5 PROJECT CONDITIONS

- A. Protect work in progress from weather and damage. Work damaged shall be removed and replaced when so directed at no additional cost.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Units, including accessories and flashing, shall be fabricated from light-gauge steel ASTM A611 for painted deck, or ASTM A446 for galvanized deck, Grade A, having a yield strength of 33,000 psi.
- B. Coating: As herein specified, shall be:
1. Zinc Coated: ASTM A525, G60 or Fed. Spec. QQ-S-775d Type 1.

2. Zinc Coated: ASTM A525 - G90.
3. Painted: Metal shall be chemically cleaned and phosphated, after which it shall be coated with manufacturer's standard primer paint and baked. Resulting finish shall be capable of being recoated with a commercial paint, after erection.

2.2 FABRICATION AND MANUFACTURERS

- A. Composite non-cellular flooring shall be fabricated zinc coated steel units of sufficient strength to span between structural supports and safely support dead and live loads. Flooring shall be provided with interlocking side laps. Ends of units shall abut at a structural support:
 1. Top and bottom plates of units shall be fastened together with sufficient spot welds to integrate sheets into single units to develop full horizontal shear at the plane where sheets are joined.
 2. Provide and install flashing and closure plates necessary to close ends of runs of cells at openings, at columns and discontinuous ends and at points where necessary to retain concrete fill.
 3. Welds within cells, and abrasions of the factory protective coating not protected by concrete, shall be given one (1) coat of asphaltum paint, or that recommended by the flooring manufacturer.
 4. Approved Non-Cellular Units
 - a. Lok-Floor - United Steel Deck, Inc. by CANAM
 - b. Vulcraft
 - c. EC-GG - Epic
- B. Roof decking shall be standard wide rib (Type B) roof deck. Gauge and depth shall be as shown on drawings:
 1. Maximum deflection under live load shall not exceed 1/240 of span. Provide and install roof deck material including required closure strips, flashing, sump plates and valley plates.
 2. Approved Manufacturers
 - a. United Steel Deck Inc. by CANAM
 - b. Vulcraft
 - c. Epic
 3. Shop Finish: Zinc coated.
- C. Form decking shall have a maximum fiber stress (under concrete and working load) of 0.6 times the yield strength of the decking but not to exceed a stress of 36,000 psi. Maximum deflection under concrete load shall not exceed 1/240 times the span (or 3/4 inch maximum). Gauge and depth shall be as shown on drawings.
 1. Approved: 1 inch deep.
 - a. Uniform UF1X - United Steel Deck Inc. by CANAM
 2. Shop Finish: Zinc coated.

D. Hanger Systems:

1. The steel decking manufacturer shall make provision for suspending tile ceilings using non-piercing or integral tabs.
2. Hangers shall not be used for heavy ducts, light fixtures or piping greater than 1-1/2 inch in diameter.
3. Maximum hanger load shall not exceed 60 lbs. with a safety factor of 5.
4. Non-piercing tabs shall be installed over lip of units and shall be galvanized and punched with a 1/2 inch diameter hole located to be at least 2-1/2 inch below deck. See Architectural ceiling drawings for spacing of tabs.
5. Coordinate and cooperate with other Contractors on installation of hanger system.
6. Do not use hanger system with roof decking.

E. Closure Plates: Furnish and install closure plates as required.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.2 PREPARATION

- A. Examine the Contract Drawings and specifications in order to insure the completeness of the work required under this Section.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, with particular attention given to the installation of items attached to metal decks so as not to delay job progress.

3.3 INSTALLATION/APPLICATION/PERFORMANCE REQUIREMENTS

- A. Fabrication: Furnish units in lengths continuous for three or more spans. Where units are furnished in less than three spans, provide shoring decking or increase gauge thickness as required:

1. Provide openings in decking at locations shown. Reinforce decking as required:

- a. Openings 6 to 14 Inches: Place 18 gauge steel sheet over opening on top of deck and fusion weld to deck. Size of steel sheet shall be 12 inches wider and longer than opening and welds shall be 12 inches on center.
- b. Openings 15 to 24 Inches (that are not supported by structural members): Weld 1 inch by 1 inch by 1/4 inch steel angle to underside of deck at right angle to deck ribs. Extend angle 3 ribs beyond each side of opening and weld to bottom surface of each rib. Reinforce opening side parallel to deck ribs with 12 inches wide by 20 gauge steel sheet placed on top surface of decking welded at 12 inches on center.

- B. Installation: Installation shall be by an experienced Subcontractor, installed in accordance with approved shop drawings and in conformance with manufacturer's recommendation.

- C. Do not use floor deck units for storage platforms.

- D. Fasten floor deck units to steel by not less than 3/4 inch diameter fusion welds spaced 12 inches on center with a minimum of 2 welds per unit.
- E. Fasten roof deck units to steel by not less than 1/2 inch diameter fusion welds spaced 6 inches on center at end laps and 12 inches on center at intermediate supports.
- F. Fasten side laps of adjacent deck units between supports at intervals not exceeding 30 inches on center.
- G. Install and anchor roof deck units to resist gross uplift load of 45 psf at eave overhang and 30 psf for other roof areas.
- H. Furnish and install shims required for support of deck at ridge, hip and valley rafter beams. Provide tapered shims as required. Weld shims to beam flange and deck.
- I. Temporarily seal joints and openings promptly after installation of decking to prevent entrance of water or foreign matter into cells. Permanent installation of cover plates, taping and sealing shall be done under another division of the specification.
- J. Field Paint: Touchup welds and any abrasions to factory finish with the manufacturer's approved zinc coating or paint.

3.4 FIELD QUALITY CONTROL

- A. Welding Inspection: Welding during installation will be inspected by the Testing Laboratory. This inspection will be performed in accordance with pertinent provisions of the American Welding Society Code and of the Building Code of the City of New York, as amended to date. In case of conflict, the latter shall govern. The Testing Laboratory's inspector shall be given free access to the work and reasonable inspection facilities.
- B. Testing: Welded decking in place is subject to inspection and testing as described in Section 051223. Remove work found to be defective and replace with new acceptable work.

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SECTION 054000

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the cold formed metal framing as indicated on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. "C" shaped steel studs for exterior non-load bearing wall construction.
 - 2. Anchors and accessories.
 - 3. Gypsum sheathing.

1.3 RELATED SECTIONS

- A. Masonry - Section 042000.
- B. Structural steel - Section 051200.
- C. Building insulation - Section 072100.
- D. Vapor permeable air barrier - Section 072700.
- E. Aluminum composite wall panels - Section 074243.
- F. Interior steel stud construction - Section 092900.

1.4 QUALITY ASSURANCE

- A. Component Design: Compute structural properties of studs in accordance with AISI "Cold Form Steel Design Manual."
- B. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.
- C. Qualifications
 - 1. Manufacturer's Qualifications: Minimum five years' experience in producing products of the type specified.

2. Installer's Qualifications: Minimum three years' experience in installation of the type of product specified.
3. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M "Structural Welding Code - Steel" and AWS DL3 "Structural Welding Code - Sheet Steel."

D. Pre-Installation Meeting

1. Convene meeting at project site within one week of scheduled start of installation with representatives of the following in attendance: Owner, Architect, General Contractor, and metal framing subcontractor.
2. Review substrate conditions, requirements of related work, installation instructions, storage and handling procedures, and protection measures.
3. Keep minutes of meeting, including responsibilities of various parties and deviations from specifications and installation instructions. Distribute minutes to attendees within 72 hours.

1.5 SUBMITTALS

- A. Product Data: For information only, submit copies of manufacturer's product information and installation instructions for each item of cold formed framing and accessories.

B. Shop Drawings

1. Submit shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data. Include placing drawings for framing members showing size and gauge designations, number, type, location and spacing. Indicate supplemental bracing, splices, accessories and details as may be required for proper installation.
2. If the Contractor elects to prefabricate framing members into panels for erection, he shall submit shop drawings of such panels at suitable scale showing all dimensions, components, and methods of fastening and support.

C. Engineering Data

1. Submit Engineering Data drawings to the Architect for review. The Contractor is responsible for the structural design and supports for the cold formed metal frame, and must show his proposed system and how the Performance Criteria noted below is accommodated on these drawings.
2. These drawings must show all load conditions and design calculations relative to connections, fastening devices and anchorage, as well as size and gauge of members. Calculations and drawings must be prepared by a Structural Engineer licensed in the State of New York, and shall be signed and sealed by this Engineer.

D. Quality Assurance Submittals: Submit the following:

1. Qualifications: Proof of manufacturer, installer, and welder qualifications.

2. Structural design calculations.
3. Certificates
 - a. Mill certificates signed by framing member/accessory manufacturer certifying compliance with material requirements.
 - b. Welder certificates.
4. Manufacturer's installation instructions for framing members and framing accessories.

1.6 PERFORMANCE CRITERIA

- A. Cold formed metal framing system shall be designed, fabricated, and installed to withstand a 30 psf suction and pressure load (or greater if required by Code) with a maximum deflection of $L/360$ with metal panels and $L/720$ with masonry.
- B. Design system to accommodate vertical deflection of structural building frame, live loading, seasonal and day/night temperature ranges and construction tolerances.
- C. Comply with Local Law 17-95 for seismic connections and loads.

1.7 PRODUCT DELIVERY AND STORAGE

- A. Protect metal framing units from rusting and damage. Deliver to one project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off the ground in a dry ventilated space or protect with suitable waterproof coverings.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Provide cold formed steel framing manufactured by Marino/Ware, Dale/Incor, Superior Steel Studs, U.S. Gypsum Co., or approved equal.

2.2 METAL FRAMING

- A. System Components: With each type of metal framing required, provide manufacturer's standard steel runners, (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners and accessories, as recommended by manufacturer for the applications indicated, as needed to provide a complete metal framing system.

2.3 FRAMING MEMBERS

- A. Studs: ASTM A 653 steel, galvanized, channel shaped with lipped flanges, punched web, size as shown on Drawings, thickness and grade as required by structural design calculations.
- B. Tracks: ASTM A 653 steel, same designation, coating, and thickness as studs except as otherwise noted, channel shaped, solid web, depth compatible with studs, size, thickness and grade as required by structural design calculations.

2.4 FRAMING ACCESSORIES

- A. Material: ASTM A 653 steel; SS Grade 50, Class 1, 50 ksi minimum yield strength, 65 ksi minimum tensile strength, G60 hot-dipped galvanized coating.
- B. Stamp manufacturer's name on each accessory item.
- C. Provide screws with accessories designated for screw attachment.
- D. Connector Devices
 - 1. Vertical Deflection Clips: VertiClip, including step bushings, as manufactured by The Steel Network Inc. (919) 845-1025 or approved equal. Rigid attachments to structure and screw attachment to stud web using step-bushings to permit frictionless vertical movement. 68 mils minimum thickness, size as required by structural design calculations.
 - 2. Rigid Clip Angles: StiffClip as manufactured by The Steel Network Inc., or approved equal, size as required by structural design calculations. Rigid attachment to structure and stud web.
- E. Bridging
 - 1. Cold Rolled Channel: 1-1/2 by 1/2 inch by 56 mil thick.
 - a. Bridging Clip: BridgeClip as manufactured by The Steel Network Inc. or approved equal. Provide attachment through stud punch-out clamping onto stud web and wrapping around bridging channel. Provide holes for screw attachment to stud web and channel.
 - 2. Flat Strap: Width and thickness as required by structural design calculations. Rigid attachment to stud flange.
 - 3. Solid Bridging: Channel shaped bridging with lipped flanges and integral formed clips. Screw attachment to stud. 33 mils minimum thickness, size as required by structural design calculations.
 - 4. Bridging and accessories shall be hot dip zinc coated per ASTM A 153.

2.5 FASTENERS

- A. Screws: Corrosion resistant coated, self-drilling, pan or hex washer head. Provide screw type and size as required by structural design calculations.
- B. Anchor Bolts and Studs: ASTM A 307, Grade A, carbon steel, with hex-head carbon steel nuts and flat steel washers. Hot-dip zinc coated in accordance with ASTM A 153. Provide bolt or stud type and size as required by structural design calculations.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain,

without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

2.6 GALVANIZING TOUCH-UP

- A. For touching up damaged galvanized surfaces after erection, provide Z.R.C. Cold Galvanizing Compound made by Z.R.C. Chemical Products Co.

2.7 SHEATHING AND RELATED ACCESSORIES

- A. Gypsum Sheathing: 5/8" thick "Dens-Glass Gold Fireguard," Type X, made by Georgia Pacific, or equal made by U.S. Gypsum Co. or National Gypsum, meeting the following criteria:

Surfacing	Inorganic glass fiber mat
Racking Strength, lbs./ft. (dry) (Ultimate-not design value)	617
Flexural strength, parallel, lbs. (4 feet, weak direction)	80
Humidified Deflection, inches	2/8
Surface Water Absorption, grams	0.84
Permeance (perms)	23 (est.)
"R" Value	0.56
Flame Spread	0
Combustible	
Core	no
Mat	no

- B. Fasteners: 1-1/4" Type S-12 screws "Climaseal" finish.
- C. Joint Treatment: Provide a one-part high performance sealant conforming to ASTM C 920, Type S, Grade NS, Class 25 meeting with the approval of the air/vapor barrier manufacturer for compatibility; see Section 072700 for description. Apply a 3/8" bead of sealant to the joint and trowel flat. Apply enough of the same material to each fastener to cover completely when trowel flat.

2.8 FABRICATION

- A. Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion in any members in the assembly.
- B. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting or screw fasteners, as standard with manufacturer.

- C. Wire tying of framing components is not permitted.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where cold formed metal framing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION OF FRAMING

- A. Installation tolerances shall be as follows:

1. Variation From Plumb, Level And True To Line: 1/8" in 10 feet.
2. Member Spacing: Not more than 1/8" plus or minus from spacing required.

- B. General

1. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.
2. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to the layout at base and tops of studs. Secure tracks as recommended by the stud manufacturer for the type of construction involved, except do not exceed 16" o.c. spacing for nail or power-driven fasteners, or 12" o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.
3. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements. Space studs as shown on approved structural shop drawings. Install studs in single piece lengths.
4. Where stud system abuts structural columns or walls, including masonry walls, anchor with stiffeners to supporting structure.
5. Install supplementary framing, blocking and bracing in metal framing systems required for rigidity and wherever walls or partitions are indicated to support fixtures, railings, equipment, services, casework, heavy trim and furnishings and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with the stud manufacturer's recommendations and industry standards in each case, considering the weight or loading resulting from the item supported.
6. At track butt joints, abutting pieces of track shall be securely anchored to a common structural building frame element, or they shall be butt welded or spliced together.
7. Studs shall be plumbed, aligned and securely attached to the flanges or webs of both upper and lower tracks by welding or screw fastening at both inside and outside flanges.

8. Temporary bracing shall be provided until erection is completed.
 9. Wall stud bridging shall be installed by welding in a manner to provide resistance to both minor axis bending and rotation. Bridging rows shall be spaced according to the following schedule:
 - a. Walls up to 10 ft. height: 2 rows of bridging equally spaced.
 - b. Walls over 10 ft. height: Bridging equally spaced at 4 ft. o.c. max.
 10. Splices in axially loaded studs shall not be permitted.
 11. Provide insulation equal to that specified in Section 072100 in all doubled jamb studs and doubled header members which will not be accessible to the insulation trades.
 12. At corners of stud walls provide 3 studs min., located so as to provide surfaces for attachment of all interior and exterior facings.
 13. Provide web stiffeners at reaction points where indicated by approved structural shop drawings.
 14. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jack studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated on final shop drawings.
 15. Frame both sides of expansion and control joints with separate studs; do not bridge the joint with components of stud system.
- C. Touch-up shop-applied galvanized coating damaged during handling and installation. Use galvanizing repair coating specified herein for galvanized surfaces.

3.3 INSTALLATION OF GYPSUM SHEATHING

- A. Fasten sheathing to exterior of each stud with 1" Type S-12 galvanized screws spaced 3/8" from ends and edges and approx. 8" o.c. Sheathing board shall be installed horizontally. Apply sealant between joints and trowel flush; and apply sealant around sheathing perimeter and at interface with other materials. Cover fastener heads with sealant and trowel flush.
- B. Refer to Section 072700 for vapor permeable air barrier description.

END OF SECTION

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SECTION 055000

MISCELLANEOUS METALS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the miscellaneous metal work as indicated on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Rough hardware.
 - 2. Vertical steel ladders.
 - 3. Steel pipe handrails and railings not part of steel pan stair assemblies.
 - 4. Loose steel lintels.
 - 5. Light steel framing and supports, not included as part of work of other trades.
 - 6. Structural steel door frames at service doors.
 - 7. Masonry support steel.
 - 8. Sleeves in concrete walls and slabs.
 - 9. Aluminum grating utilized as site perimeter fencing.
 - 10. Steel framing, bracing, supports, anchors, bolts, shims, fastenings, and all other supplementary parts indicated on drawings or as required to complete each item of work of this Section.
 - 11. Prime painting, touch-up painting, galvanizing and separation of dissimilar metals for work of this Section.
 - 12. Cutting, fitting, drilling and tapping work of this Section to accommodate work of other Sections and of concrete, masonry or other materials as required for attaching and installing work of this Section.

1.3 RELATED SECTIONS

- A. Structural steel - Section 051200.
- B. Steel pan stairs - Section 055100.
- C. Painting - Section 099000.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
- C. Reference Standards: The work is subject to requirements of applicable portions of the following standards:
 - 1. "Manual of Steel Construction," American Institute of Steel Construction.
 - 2. AWS D1-1 "Structural Welding Code," American Welding Society.
 - 3. SSPC SP-3 "Surface Preparation Specification No. 3, Power Tool Cleaning," Steel Structures Painting Council.
 - 4. SSPC PA-1 "Painting Application Specification," Steel Structures Painting Council.
 - 5. "Handbook on Bolt, Nut and Rivet Standards," Industrial Fasteners Institute.
- D. Steel Materials: For steel to be hot dip-galvanized, provide steel chemically suitable for metal coatings complying with the following requirements: carbon below 0.25 percent, silicon below 0.24 percent, phosphorous below 0.05 percent, and manganese below 1.35 percent. Notify galvanizer if steel does not comply with these requirements to determine suitability for processing.
- E. Engage the services of a galvanizer who has demonstrated a minimum of five (5) years' experience in the successful performance of the processes outlined in this specification in the facility where the work is to be done and who will apply the galvanizing and coatings within the same facility as outlined herein. The Architect has the right to inspect and approve or reject the galvanizer/galvanizing facility.
- F. The galvanizer/galvanizing facility must have an ongoing Quality Control/Quality Assurance program which has been in effect for a minimum of five years and shall provide the Architect with process and final inspection documentation. The galvanizer/galvanizing facility must have an on-premise testing facility capable of measuring the chemical and metallurgical composition of the galvanizing bath and pickling tanks.
- G. Inspection and testing of hot-dip galvanized coating shall be done under the guidelines provided in the American Hot-Dip Galvanizers Association (AGA) publication "Inspection of Products Hot-Dip Galvanized After Fabrication."

1.5 PERFORMANCE STANDARDS

- A. Railings shall be designed to resist loads as specified in Article 3, Section 27-558 of the New York City Building Code.

1.6 SUBMITTALS

- A. Manufacturer's Literature: Submit manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions for products to be used in the fabrication of miscellaneous metal work, including paint products.
- B. Shop Drawings: Shop drawings for the fabrication and erection of all assemblies of miscellaneous iron work which are not completely shown by manufacturer's data sheets. Include plans and elevations at not less than 1" to 1'-0" scale, and include details of sections and connections at not less than 3" to 1'-0" scale. Show anchorage and accessory items. All fasteners shall be identified and completely located.
- C. Engineering Data
 - 1. Before any ladders and railings are fabricated, submit engineering data drawings to the Architect for review indicating how performance standards specified here shall be met. The Contractor is responsible for the structural design and supports for these systems and must show his proposed systems on these drawings.
 - 2. These drawings must show all load conditions and design calculations relative to connections, fastening devices and anchorage, as well as size and gauge of members. Calculations and drawings must be prepared by a Structural Engineer licensed in the State of New York and shall be signed and sealed by this Engineer.
- D. Welding shall be indicated on shop drawings using AWS symbols and showing length, size and spacing (if not continuous). Auxiliary views shall be shown to clarify all welding. Notes such as 1/4" weld, weld and tack weld are not acceptable.
- E. Certification: For items to be hot-dip galvanized, identify each item galvanized and to show compliance of application. The Certificate shall be signed by the galvanizer and shall contain a detailed description of the material processed and the ASTM standard used for the coating and, the weight of the coating. In addition, and as attachment to Certification, submit reports of testing and inspections indicating compliance with the provisions of this Section.

PART 2 PRODUCTS

2.1 MATERIALS

A. Metals

- 1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- 2. Steel Plates, Shapes and Bars: ASTM A 36.
- 3. Steel Tubing: Cold formed, ASTM A 500; or hot rolled, ASTM A 501.

4. Structural Steel Sheet: Hot rolled, ASTM A 570; or cold rolled, ASTM A 611, Class 1; of grade required for design loading.
5. Galvanized Structural Steel Sheet: ASTM A 924, of grade required for design loading. Coating designation G90.
6. Steel Pipe: ASTM A 53, type and grade as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (Schedule 40), unless otherwise indicated.
7. Gray Iron Castings: ASTM A 48, Class 30, unless another class is indicated or required by structural loads.
8. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
9. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
10. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

B. Aluminum

1. Aluminum, General: Provide alloy and temper recommended by aluminum producer for type of use indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
2. Extruded Bars and Shapes: ASTM B 221, alloys as follows:
 - a. 6061-T6 or 6063-T6, for bearing bars of gratings and shapes.
 - b. 6061-T1, for grating crossbars.

C. Grout: Non-shrink, non-metallic grout conforming to the requirements of Section 03300.

D. Fasteners

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
3. Anchor Bolts: ASTM F 1554, Grade 36.
4. Lag Bolts: ASME B18.2.1.
5. Machine Screws: ASME B18.6.3.
6. Plain Washers: Round, carbon steel, ASME B18.22.1.
7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

9. Lock Washers: Helical spring type carbon steel, ASME B18.21.1.
- E. Shop Paint: Shop prime all non-galvanized miscellaneous metal items using Series 88 Azero Primer made by Tnemec or approved equal.
- F. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D 1187.
- G. Galvanize Repair Coating: For touching up galvanized surfaces after erection, provide repair coating conforming to ASTM A 870 equal to Z.R.C. Cold Galvanizing Compound made by Z.R.C. Chemical Products Co. or approved equal.

2.2 PRIME PAINTING

- A. Scope: All ferrous metal (except galvanized steel) shall be cleaned and shop painted with one coat of specified ferrous metal primer. No shop prime paint required on galvanized steel or aluminum work.
- B. Cleaning: Conform to Steel Structures Painting Council Surface Preparation Specification SP 3 (latest edition) "Power Tool Cleaning" for cleaning of ferrous metals which are to receive shop prime coat.
- C. Application
 1. Apply shop prime coat immediately after cleaning metal. Apply paint in dry weather or under cover. Metal surfaces shall be free from frost or moisture when painted. Paint all metal surfaces including edges, joints, holes, corners, etc.
 2. Paint surfaces which will be concealed after shop assembly prior to such assembly. Apply paint in accordance with approved paint manufacturer's printed instructions, and the use of any thinners, adulterants or admixtures shall be only as stated in said instructions.
 3. Paint shall uniformly and completely cover the metal surfaces, 2.0 mils minimum dry film thickness. No work shall be shipped until the shop prime coat thereon has dried.
- D. Touch-Up: In the shop, after assembly and in the field, after installation of work of this Section, touch-up damaged or abraded portions of shop prime paint with specified ferrous metal primer.
- E. Apply one shop coat to fabricated metal items, except apply two (2) coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

2.3 GALVANIZING

- A. Scope: All ferrous metal exposed to the weather, and all ferrous metals indicated on drawings or in specifications to be galvanized, shall be cleaned and then hot-dipped galvanized after fabrication as provided by Duncan Galvanizing or approved equal.
- B. Avoid fabrication techniques that could cause distortion or embitterment of steel items to be hot-dip galvanized. Fabricator shall consult with hot-dip galvanizer regarding potential warpage problems or handling problems during the galvanizing

process that may require adjustment of fabrication techniques or design before finalizing shop drawings and beginning of fabrication.

- C. Cleaning: Thoroughly clean metal surfaces of all mill scale, rust, dirt, grease, oil, moisture and other contaminants prior to galvanizing.
 - D. Application: Hot-dip galvanizing shall be applied in accordance with:
 - 1. ASTM A 143: Safeguarding Against Embitterment of Hot-Dip Galvanized Structural Steel.
 - 2. ASTM A 123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A 153: Galvanized Coating on Iron and Steel Hardware - Table 1.
 - 4. ASTM A 385: Practice for Providing High Quality Zinc Coatings.
 - 5. ASTM A 924: Galvanized Coating on Steel Sheets.
 - 6. Minimum weight of galvanized coating shall be two (2) oz. per square foot of surface.
 - E. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
 - F. All galvanized materials must be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer, the weight of the coating, and the appropriate ASTM number.
 - G. To minimize surface imperfection (eg: flux inclusions), material to be galvanized shall be dipped into a solution of Zinc Ammonium Chloride (pre-flux) immediately prior to galvanizing. The type of galvanizing process utilizing a flux blanket overlaying the molten zinc will not be permitted.
 - H. After galvanizing all materials not exposed to view must be chromated by dipping material in a 0.2% chromic acid solution.
 - I. Galvanized surfaces, where exposed to view, must have a smooth, level surface finish. Where this does not occur, piece shall be rejected and replaced to the acceptance of the Architect.
- 2.4 PROTECTIVE COATINGS
- A. Whenever concealed surfaces of dissimilar metals will be in contact, separate contact surfaces by coating each contact surface prior to assembly or installation with one coat of specified bituminous paint, which shall be in addition to the specified shop prime paint. Mask off those surfaces not required to receive protective coating.

2.5 WORKMANSHIP

- A. General

1. Miscellaneous metal work shall be fabricated by an experienced fabricator or manufacturer and installed by an experienced tradesman.
 2. Materials, methods of fabrication, fitting, assembly, bracing, supporting, fastening, operating devices, and erection shall be in accordance with drawings and specifications, approved shop drawings, and best practices of the industry, using new and clean materials as specified, having structural properties sufficient to safely sustain or withstand stresses and strains to which materials and assembled work will be subjected.
 3. All work shall be accurately and neatly fabricated, assembled and erected.
- B. Shop Assembly: Insofar as practicable, fitting and assembly of work shall be done in shop. Shop assemble work in largest practical sizes to minimize field work. It is the responsibility of the miscellaneous metal subcontractor to assure himself that the shop-fabricated miscellaneous metal items will properly fit the field condition. In the event that shop-fabricated miscellaneous metal items do not fit the field condition, the item shall be returned to the shop for correction.
- C. Cutting: Cut metal by sawing, shearing, or blanking. Flame cutting will be permitted only if cut edges are ground back to clean, smooth edges. Make cuts accurate, clean, sharp and free of burrs, without deforming adjacent surfaces or metals.
- D. Holes: Drill or cleanly punch holes; do not burn.
- E. Connections: Make connections with tight joints, capable of developing full strength of member, flush unless indicated otherwise, formed to exclude water where exposed to weather. Locate joints where least conspicuous. Unless indicated otherwise, weld or bolt shop connections; bolt or screw field connections. Provide expansion and contraction joints to allow for thermal movement of metal at locations and by methods approved by Architect.
1. Welding
 - a. Shall be in accordance with "Standard Code for Welding in Building Construction" of the American Welding Society, and shall be done with electrodes and/or methods recommended by the manufacturer of the metals being welded.
 - b. Welds shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth with and to match finish of adjoining surfaces; undercut metal edges where welds are required to be flush.
 - c. All welds on or behind surfaces which will be exposed to view shall be done so as to prevent distortion of finished surface. Remove weld spatter and welding oxides from all welded surfaces.
 2. Bolts and Screws: Make threaded connections tight with threads entirely concealed. Use lock nuts. Bolts and screw heads exposed to view shall be flat and countersunk. Cut off projecting ends of exposed bolts and screws flush with nuts or adjacent metal.
- F. Operating Mechanism: Operating devices (i.e. pivots, hinges, etc.) mechanism and hardware used in connection with this work shall be fabricated, assembled, installed

and adjusted after installation so that they will operate smoothly, freely, noiselessly and without excessive friction.

- G. Built-In Work: Furnish anchor bolts, inserts, plates and any other anchorage devices, and all other items specified under this Section of the Specifications to be built into concrete, masonry or work of other trades, with necessary templates and instructions, and in ample time to facilitate proper placing and installation.
- H. Supplementary Parts: Provide as necessary to complete each item of work, even though such supplementary parts are not shown or specified.
- I. Coordination: Accurately cut, fit, drill and tap work of this Section to accommodate and fit work of other trades. Furnish or obtain, as applicable, templates and drawings to or from applicable trades for proper coordination of this work.
- J. Exposed Work
 - 1. In addition to requirements specified herein and shown on drawings, all surfaces exposed to view shall be clean and free from dirt, stains, grease, scratches, distortions, waves, dents, buckles, tool marks, burrs, and other defects which mar appearance of finished work.
 - 2. Metal work exposed to view shall be straight and true to line or curve, smooth arrises and angles as sharp as practicable, miters formed in true alignment, profiles accurately intersecting, and with joints carefully matched to produce continuity of line and design.
 - 3. Exposed fastenings, where permitted, shall be of the same material, color and finish as the metal to which applied, unless otherwise indicated, and shall be of the smallest practicable size. All fasteners are to be reviewed and approved by the Architect.
- K. Preparation for Hot-Dip Galvanizing: Fabricator shall correctly prepare assemblies for galvanizing in consultation with galvanizer and in accordance with applicable Reference Standards and applicable AGA publications for the "Design of Products to be Hot-Dip galvanized After Fabrication." Preparation shall include but not be limited to the following:
 - 1. Remove welding flux.
 - 2. Drill appropriate vent holes and provide for drainage in inconspicuous locations of hollow sections and semi-enclosed elements. After galvanizing, plug vent holes with shaped lead and grind smooth.

2.6 MISCELLANEOUS METALS ITEMS

A. Rough Hardware

- 1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 Sections.

2. Fabricate items to sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood connections; elsewhere, furnish steel washers.

B. Ladders

1. Vertical steel ladders shall be eighteen (18) inches wide with 3/4" diameter non-slip steel rungs spaced twelve (12) inches o.c. Stringers shall be 3/8" thick by 2-1/2" wide steel bars; rungs welded to bars. Attach ladders to walls six (6) inches from top and bottom and maximum thirty-six (36) inches o.c. from these points. At the roof, gooseneck the rails back to the structure to provide secure ladder access.
2. Ladders shall be fabricated to support a live load of one hundred (100) lbs. per square foot and a concentrated load of three hundred (300) lbs. per rung; loads not to act simultaneously.

C. Steel Pipe Handrails

1. Steel pipe of size shown on Drawings, Schedule 40. Fittings shall be flush type, malleable of cast iron. Brackets shall be malleable iron, design as selected by the Architect.
2. Construction: Form direction changes in rails using solid bar stock or elbows. Connections shall be shop welded and ground smooth and flush, except where field connections and expansion joints are required. Field connections may be welded, internal sleeve and plug weld, or internal sleeve and set screw.
3. Secure handrails to walls with wall brackets. Provide brackets of malleable iron castings, with not more than three (3) inches clearance from inside face of handrail to wall surface. Neatly drill wall plate portion of the bracket into concrete or masonry to receive bolts for concealed anchorage. For installation at drywall, Drywall trades shall provide plate to receive wall plate portion of bracket and anchor or bolt wall plate through drywall to supporting steel plate. Locate brackets at not more than 5'-0" o.c. unless otherwise shown.
4. Provide wall return fittings of cast iron, flush type, with the same projection as that specified for wall brackets.
5. Longitudinal members shall be parallel with each other and with floor surface or shape of stair to a tolerance of 1/8" in 10'-0" linear feet. Center line of members within each run of railing shall be in the plane.
6. For steel pipe posts where indicated, anchor posts in concrete by means of pipe sleeves set and anchored into concrete. Provide sleeves of galvanized steel pipe, not less than six (6) inches long and having an inside diameter not less than 1/2" greater than outside diameter of the inserted pipe. Provide steel plate closure secure to bottom of sleeve and of width and length not less than one (1) inch greater than outside diameter of sleeve. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-ferrous grout. Cover anchorage joint with a round steel flange welded to post. Posts shall be set plumb within 1/8" vertical tolerance.

7. Steel pipe handrails shall be capable of resisting a two hundred (200) lb. force applied to rail from any direction and a uniformly distributed load of fifty (50) lbs. per linear foot applied downward or horizontally, loads not to act simultaneously.

D. Loose Steel Lintels

1. Provide loose structural steel lintels for openings and recesses in masonry walls and partitions as shown. Weld adjoining members together to form a single unit where indicated. Provide not less than eight (8) inches bearing at each side of openings, unless otherwise indicated.
2. Loose lintels shall conform to the following Schedule:

Opening Width (Maximum)	WALL THICKNESS		
	4 inches	6 inches	8 inches*
2'-0"	3-1/2" x 3-1/2" x 1/4"	6" x 4" x 5/16"	3-1/2" x 3-1/2" x 1/4"
3'-0"	3-1/2" x 3-1/2" x 5/16"	6" x 4" x 5/16"	3-1/2" x 3-1/2" x 5/16"
4'-0"	3-1/2" x 3-1/2" x 5/16"	6" x 4" x 5/16"	3-1/2" x 3-1/2" x 5/16"
5'-0"	4" x 3-1/2" x 3/8"	6" x 4" x 3/8"	4" x 3-1/2" x 5/16"
6'-0"	5" x 3-1/2" x 3/8"	6" x 4" x 3/8"	5" x 3-1/2" x 5/16"
7'-0"	5" x 3-1/2" x 3/8"	5" x 5" x 1/2"	5" x 3-1/2" x 3/8"
8'-0"	5" x 3-1/2" x 3/8"	5" x 5" x 5/8"	5" x 3-1/2" x 3/8"

* Two angles at all openings in eight (8) inch walls.

3. At columns or vertical surfaces where lintels cannot bear on masonry, provide clip angles sized for structural capacity of lintel.

E. Miscellaneous Light Steel Framing

1. Light steel framing, bracing, supports, framing, clip angles, shelf angles, plates, etc., shall be of such shapes and sizes as indicated on the drawings and details or as required to suit the condition and shall be provided with all necessary supports and reinforcing such as hangers, braces, struts, clip angles, anchors, bolts, nuts, welds, etc., as required to properly support and rigidly fasten and anchor same in place and to steel, concrete, masonry and all other connecting and adjoining work.
2. All light steel framing steel shall be furnished and erected in accordance with the applicable requirements of the "Specifications for the Design, Fabrication

and Erection of Structural Steel for Buildings" by the American Institute of Steel Construction and as specified herein.

F. Structural Steel Door Frames

1. Fabricate steel door frames of structural shapes and bars, fully welded, uniform, square and true. Plug weld built-up members, continuously weld exposed joints; grind exposed welds smooth. Provide 5/8" x 1-1/2" steel bar stops. Secure removable stops to frame with countersunk machine screws, uniformly spaced at not more than ten (10) inches o.c.
2. Provide necessary reinforcements and drill and tap as required for finish hardware.
3. Provide steel strap anchors for securing door frames into adjoining concrete or masonry, using 1/8" x 2" straps of the length required for a minimum eight (8) inch embedment. Weld anchors to frame jambs no more than twelve (12) inches from both bottom and head of frame and space anchors not more than thirty (30) inches apart.
4. Extend bottom of frames to floor elevation and secure to concrete with steel angle clips welded to frames, anchored with expansion shields and bolts.

G. Masonry Support Steel

1. Provide galvanized steel, relieving angles, plates, accessories and other steel shapes for masonry support steel; for lintels refer to Para. E. herein.
2. Fabricate masonry support steel to allow final adjustment with the closest tolerances possible. Relieving angles which require cutting to fit masonry flashing shall be straightened without deflections.
3. Coordinate masonry support system with concrete work for locations of wedge inserts.
4. Install to meet requirements of building masonry work, face brick coursing and stone placement. Coordinate final adjustments with masonry work as work progresses.

H. Sleeves in Concrete Walls and Slabs

1. Sleeves through concrete walls shall be of Schedule 40 steel pipe with i.d. two (2) inches larger than o.d. of pipe or conduit (including insulation, if any) to be accommodated. Sleeves shall project one-half (1/2) inch on each side of finished wall. Provide rectangular one-quarter (1/4) inch steel plate collar at center, continuously welded to the perimeter of the sleeve, and six (6) inches wider than the o.d.
2. Slots in slabs shall be 12 gauge steel sheet, galvanized, of dimensions indicated, with strap anchors welded in place not more than twelve (12) inches on centers.

- I. Aluminum Grating: Provide grating fabricated from aluminum as specified above, with Class I clear anodized finish. Grating pattern and design shall be selected by Architect from Ohio Gratings or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where miscellaneous metal is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 ERECTION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required. All exposed fasteners are to be approved by the Architect.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry, or similar construction.
- C. Fitting Connections: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance, and quality of welds made, and methods used in correcting welding work.
- E. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- F. Field Touch-Up of Galvanized Surfaces: Touch-up shop applied galvanized coatings damaged during handling and installation. Use galvanizing repair coating specified herein for galvanized surfaces.

END OF SECTION

SECTION 055100

STEEL PAN STAIRS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the steel pan stairs as indicated on the drawings and specified herein, including, but not limited to, the following:
 - 1. Steel pan stairs, including all clips, hangers, inserts, braces and other supports.
 - 2. Ornamental glass railing system with aluminum handrails and brackets and aluminum shoe.
 - 3. Ornamental stainless steel handrails, including supports, brackets, and anchors.

1.3 RELATED SECTIONS

- A. Structural steel - Section 051200.
- B. Miscellaneous metals - Section 055000.
- C. Glass and glazing - Section 088000.
- D. Installation of inserts in drywall furnished by this Section - Section 092900.
- E. Stone stair treads - Section 093000.
- F. Finish painting - Section 099000.

1.4 QUALITY ASSURANCE

- A. Qualification of Welders: Use only certified welders and the shielded arc process for all welding performed in connection with the work of this Section. Protect adjacent surfaces when field welding to prevent damage or stain. Welders and welding operators must be qualified by tests as provided by AWS.
- B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with:
 - 1. "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction.
 - 2. "Code for Welding in Building Construction" of the American Welding Society.

3. "Metal Stairs Manual" of the National Association of Architectural Metal Manufacturers.
 - C. Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards of these specifications, the provisions of the more stringent shall govern.
 - D. Field Measurements: If construction process permits, take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress. Allow for trimming and fitting wherever taking field measurements before fabrication might delay work.
 - E. Tolerances: Allow for construction tolerances as required.
 - F. Coordination: Coordinate this work with the work of all other trades interfacing with metal pan stairs, such as structural openings, sprinklers and standpipes, and other trades as required.
- 1.5 DRAWING SUBMISSION
- A. General: It is the intent of the Working Drawings to display the layouts and general design parameters upon which the Shop Drawings shall be developed. Detail development and all connections shall be part of Shop Drawing Development.
 - B. Shop Drawings
 1. Before any steel stairs are fabricated, submit shop drawings to the Architect for approval.
 2. Show all locations, markings, quantities, materials, sizes and shapes, and indicate all methods of connecting, anchoring, fastening, bracing, for the stair construction, support and attachment to the work of other trades.
 - C. Engineering Data
 1. Before any metal pan stairs are fabricated, submit engineering data drawings to the Architect for review. The Contractor is responsible for the structural design and supports for the stair system and must show his proposed system on these drawings.
 2. These drawings must show all load conditions and design calculations relative to connections, fastening devices and anchorage, as well as size and gauge of stair members. Calculations and drawings must be prepared by a Structural Engineer licensed in the State of New York and shall be signed and sealed by this Engineer. Include engineering design and calculations for glass railing assembly.
- 1.6 SAMPLES SUBMISSION
- A. Submit the following listed samples and other samples as may be requested by the Architect, to show the quality standards:
 1. Railing bracket.
 2. Exposed weld.

3. Exposed bolted connection.
 4. Bent pipe railing.
 5. Glass, 12" x 12" for each type and thickness indicated.
 6. Metal Finishes: Submit finish samples, 6" x 6", for finish system specified. The samples submitted shall be representative of the workmanship and finishes of all work of this Section to be incorporated in the completed project.
 7. Ornamental rail assemblies, 2'-0" long, to show end condition, mounting assemblies and typical tight joint and finish.
- B. Samples shall be submitted cleaned and shop primed and shall represent standards to which all respective materials used in the Project shall meet.

1.7 PERFORMANCE STANDARDS

- A. Stairs and railings shall be constructed to conform to the following performance standards, unless greater required by Code:
1. Stairs and platforms shall support a live load of one hundred (100) psf and a concentrated live load of three hundred (300) lbs. and shall have a live load deflection limited to 1/360 of the span. Loads shall not apply simultaneously.
 2. Railings shall withstand a two hundred (200) lb. force applied to rail from any direction, and a uniformly distributed load of 50 lbs./lin. ft. applied downward or horizontally, loads not to act simultaneously.

1.8 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect steel pan stair before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structural Steel: ASTM A 36.
- B. Steel Sheets: ASTM A 245, Grade C, minimum ten (10) gauge for platforms, twelve (12) gauge minimum for treads and risers.
- C. Malleable Iron Castings: ASTM A 47, Grade 35018.
- D. Bolts and Nuts: ASTM A 307, Grade A bolts.
- E. Machine Screws: Fed Spec. FF-S-92.
- F. Expansion Bolts: "Cinch" type, galvanized, of approved manufacture.

- G. Threaded End Hanger Rods: Minimum 3/4" diameter, ASTM A 36.
- H. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- I. Bituminous Paint: Fed. Spec. TT-C-494.
- J. Concrete Fill and Reinforcing Materials
 - 1. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, ready-mixed concrete with a minimum 28-day compressive strength of 3000 psi. Concrete to have trowel finish to receive resilient stair treads.
 - 2. Welded Wire Fabric: ASTM A 185, 6 by 6 inches – W1.4 by W1.4, unless otherwise indicated.
- K. Stainless Steel: Comply with the following standards for the forms and types of stainless steel for the required items of work.
 - 1. Type: AISI Type 302/304, unless otherwise indicated.
 - 2. Tubing: ASTM A 554; minimum wall thickness of 0.050"; thicker if required to meet performance standards specified herein.
 - 3. All stainless steel shall have No. 6 satin directional polish finish.

2.2 GLASS GUARDRAILS

- A. Provide materials which have been selected for their surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit. Exposed to view surfaces which exhibit pitting, seam marks, roller marks, "oil-canning" stains, discolorations or other imperfections on the finished units will not be acceptable.
- B. Manufacturer: Julius Blum & Co, Inc. or approved equal.
 - 1. Metal Railings: "Carlstadt Railing" as manufactured by Julius Blum & Co., Inc., with self-aligning handrail brackets.
- C. Aluminum: Comply with the following standards for the forms and types of aluminum for the required items of work.
 - 1. Alloy and Temper: Provide alloy and temper as indicated or as otherwise recommended by the aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B221 for 6063-T52; minimum thickness of 0.125".
 - 2. Aluminum Finish: Anodic finish as selected by the Architect.
 - 3. Flat Glass: Flat glass for this Section shall be clear, fully tempered, transparent and glazing quality conforming to ASTM C 1048, 1/2" thick, with exposed

edges arrised (1/16"), ground smooth and polished and sealed edges arrised and ground.

D. Glazing and Sealing Materials

1. Neoprene Setting Blocks: Solid 70 to 90 Shore A hardness, size to suit condition.
2. Neoprene Wedges and Spacers: Solid 50 Shore A hardness, size to suit condition.
3. Neoprene Cushions and Gaskets: Closed cell sponge, 20 to 30 Shore A hardness, size to suit condition.
4. Epoxy Adhesive: Pourable, non-shrinking, 70 to 80 Shore A hardness, formulated to suit glazing conditions and stress conditions.
5. Sealant: One-part silicone, sealant, 20 to 30 Shore A hardness, clear or custom color as selected by Architect. "Silicone Sealant 1200" or General Electric. Sealant primers and backing as and if recommended by sealant manufacturer.

E. Protection for Metals: Bituminous paint conforming to FS TT-C-494.

F. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.

G. Fasteners: Furnish of basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise indicated. Unless otherwise shown, provide Phillips flat-head screws for exposed fasteners. All exposed fasteners are to be approved by the Architect.

2.3 FABRICATION

A. General

1. Steel pan stair work shall be fabricated by an experienced manufacturer in accordance with approved shop drawings and best practices of the industry, using new and clean materials as specified, having structural properties sufficient to safely sustain or withstand strains and stresses to which material will be subjected.
2. Fabricate shop assemblies in largest practical sizes to minimize field work. All exposed surfaces shall be clean and free from all dirt, stains, grease marks, scratches, waves, dents, buckles, tool marks, rattles, and other objectionable defects which mar appearance or use of finished work.
3. Cutting: Cut materials by sawing, shearing, or blanking. Flame cutting will be permitted when ground back to clean edges. Cuts shall be made accurately, clean, sharp and free of burrs, without deforming adjacent metals.
4. Connections: Make connections with tight joints, capable of developing full strength of the members, flush. Locate joints where least conspicuous. Use concealed fasteners where possible. Weld or rivet shop connections; bolt, screw or weld field connections.

- a. Welding: Welds shall be continuous, except where spot welding is specifically permitted. Welding shall conform to the Standard Code of the American Welding Society. Exposed welds are required to be ground flush.
- b. Bolts and Screws: Make threaded connections tight with threads entirely concealed. Use lock nuts, or upset thread ends. Exposed bolts and screw head shall be flat and countersunk, unless otherwise indicated on drawings. Remove projecting ends of bolts and screws. Punch or drill holes; do not burn.
- c. All exposed fasteners shall be approved by the Architect.

B. Stairs and Platforms

1. Provide stringers, risers, sub-treads and platforms matching profiles as shown. Form tread pan and riser in a continuous piece to receive the finished tread; tread shall be a minimum of twelve (12) gauge. Attach risers and treads to the structural steel stringers as detailed on drawings. Fasten countersunk bolts or stud welded clips through mesh for cement fill.
2. On intermediate platforms, provide metal bases formed of stringers. Miter and weld and grind smooth internal and external corners of metal bases. Form platform runs of minimum ten (10) gauge steel.
3. Countersink bolt heads and screws on finished surfaces or cut off flush with such surfaces.
4. Properly fit and securely fasten together all parts making exposed joints close fitting. Cut, drill, punch and tap as required for installation.
5. Make joints as strong and rigid as adjoining sections. Weld continuously along entire line of contact except where spot welding is indicated.
6. Give ferrous metal surfaces a shop coat of primer. Before painting, thoroughly clean surfaces with wire brushes or other proper and effective means of removing loose scale, filings or other objectionable materials.
7. Remove grease prior to painting. Separate dissimilar metals in or adjacent to work of this Section with a coat of bituminous paint on each surface prior to installation.
8. Closure and Filler Plates: Where indicated on drawings or as required, at least twelve (12) gauge sheet steel, securely fastened to top and bottom of stringer and adjacent wall, by welding or screws.
9. Struts, Hangers, Platform Headers and Subframing
 - a. Provide supports as detailed and required, including all struts, clip angles, angles or hangers which are required and necessary for support of stair construction.
 - b. Supports shall be of size suitable for the support load, as required. Struts, angles and hangers shall be supported by and directly connected to the structural framing. Struts and hangers, with their connections, shall be concealed.

- c. Provide other inserts, anchors and/or other subframing as may be required to complete the stair construction and properly support it on the structural framing.

C. Ornamental Stainless Steel Handrails, Railings, Posts and Brackets

1. Ornamental handrails shall be 1-1/4" diameter stainless steel. Use heavier weight pipes and/or reinforce pipes internally as required to meet performance standards given in paragraph 1.7 herein. Fittings shall be flush type. Wall brackets shall be stainless steel, design as detailed.
2. Handrail, post and railing spacing shall meet Code requirements.
3. Construction: Form direction changes in rails using solid bar stock or elbows. Connections shall be shop welded, except where expansion joints are required. Field connections shall be welded for continuity. All exposed welds shall be ground smooth and flush.
 - a. If elbows are not available for angles shown, bends shall maintain full diameter of pipe, use mandrel, no kinks, ripples, flats are acceptable.
4. Secure handrails to walls with wall brackets. Provide brackets as shown on drawings. For installation in drywall, furnish Drywall Section steel plate to receive wall plate portion of bracket and anchor or bolt wall plate through drywall to supporting steel plate. Locate brackets at not more than 5'-0" o.c. unless otherwise shown.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where steel pan stairs are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Work in the field shall comply with the same requirements as specified for shop work above.
- B. Except where otherwise shown or specified for a particular item of work or for built-in work, fasten metal work to solid masonry with expansion bolts. Fastenings to wood plugs in masonry will not be accepted. Drill holes to the exact diameter of the bolts using a rotary drill for concrete and a percussion drill for other masonry. Thread screws full length to the head of the screw.
- C. Provide connecting members needed for properly securing the work to masonry, drywall and structural framing, including bolts, machine screws, rods, hangers, inserts, sleeves, plates, anchors, expansion bolts, washers and other items as required. Furnish built-in items to drywall trades as required for proper anchorage.

- D. Leave work exposed to view, including stair soffits, clean, smooth and neatly finished. All exposed welds shall be dressed smooth.
- E. Include supplementary parts necessary to complete each item even though such work is not definitively shown or specified.
- F. Coordinate and schedule the work of this Section with the work of other trades. Furnish anchors, sockets, fastenings and other miscellaneous items to be embedded in concrete or masonry, or required for securing metal work to other construction so as not to delay job progress.
- G. Attach wall railings to the wall construction, using appropriate bolts and anchors to meet performance standards.
- H. Install work plumb and true to the exact lines and levels, in the correct location and in proper relation to adjoining work.
- I. Touch up marred and abraded shop paint of exposed surfaces after erection in the field.
- J. Posts shall be set plumb within 1/8" vertical tolerance. Longitudinal members shall be parallel with each other and with floor surface or slope of stair to a tolerance of 1/8" in ten (10) linear feet. Center lines of members within each run of railing shall lie in the same vertical plane. Field joints of connecting sections shall be hairline.

3.3 TOUCH-UP PAINTING

- A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop coat, and paint exposed areas with same material used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

END OF SECTION

SECTION 056000

STRUCTURAL BEARING ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of designing, manufacturing, and installing pot style bearings in accordance with, and at the locations shown, on the plans.

1.2 QUALITY ASSURANCE

- A. The manufacturer shall demonstrate a minimum of 5 years experience in the design and manufacture of pot style bearings and be certified under the AISC Quality Certification Program - Simple Steel Bridges. Bearings shall be fabricated at facilities owned and operated by the manufacturer; the manufacturer being the single entity that designs, fabricates, delivers, and supervises the installation of the bearing assemblies.

1.3 SUBMITTALS

- A. Prior to fabrication of the bearing assemblies, the manufacturer shall submit the following items to the design engineer for review and approval:
 - 1. Signed and sealed shop drawings for all components and assemblies, including general arrangements and large scale details. The shop drawings shall include tables showing load capacity and movement rating, if applicable, of each bearing, including initial offset required at various ambient temperatures.
 - 2. Signed and sealed calculations showing conformance of the bearings to the design loadings, movements and other specified requirements.
 - 3. Weld procedures.

1.4 DESIGN REQUIREMENTS

- A. Bearings shall be designed for the loads and movements given on the Project Plans. Bearing design shall include a minimum rotation of 0.02 radians, which includes rotations due to all applicable service loads and movements, maximum rotations caused by fabrication and installation tolerances, and allowance for uncertainty. Designs shall assume that vertical and horizontal loads occur simultaneously. The design of the bearings shall meet the following additional requirements:
 - 1. Steel Rotational Elements.
 - a. Pots. The pot shall be machined from a single piece of steel. The inside diameter of the pot cavity shall be nominally equal to the diameter of the elastomeric pad. The pot shall be deep enough to permit the seal and piston rim to remain in full contact with the vertical face of the pot wall under all design loads, movements, and rotations. Contact between metal components shall not prevent further displacements or rotation. The pot walls shall be designed to withstand both the internal pressures caused by the vertical loads (considering the elastomer to behave as a fluid) and the design lateral loads.
 - b. Pistons. The piston shall be machined from a single piece of steel. When at maximum rotation, the piston thickness shall be sufficient to provide at least 0.125 inch vertical clearance between rotating and non-rotating components of the bearing assembly.

- c. The outside diameter of the piston shall be at least 0.04 inches less than the inside diameter of the pot.
 - d. For bearings carrying horizontal loads, the piston face width shall be designed assuming a contact area with the pot wall of one-third the pot circumference and allowable compressive stress not exceeding $0.8 \times F_y$.
2. Sole and Masonry Plates. The sole and masonry plates shall be designed to distribute the bearing loads into the surrounding substructure and/or superstructure. The allowable bending stress in sole and masonry plates shall be $0.63 \cdot F_y$, but thickness shall not be less than 0.75 inch. Service or installation considerations specified by the Design Engineer, such as weldability and bearing height, may require thicker masonry and sole plates than are required due to strength considerations alone.
3. Guide Bars. When necessary, guide bars shall be welded to the slide plates. Guide bars shall be designed for the specified horizontal loads, but not less than 10 percent of the vertical capacity of the bearing.
4. Guided members must have their contact area within the guide bars in all operating positions. The total clearance between guide bars and the guided member shall be 1/16 inch, $\pm 1/32$ inch.
5. Finish of Steel Components. All steel surfaces in contact with elastomer, PTFE, or other steel surfaces, shall be finished to a smoothness of 125 micro-inch (rms) or less.
6. Stainless Steel Sheet. Stainless steel sheets shall be of 16 gauge minimum thickness and shall be attached to their backing plates by continuous fillet welding along their edges. Bonding and/or mechanical fastening of sheets will not be permitted. The attachment of stainless steel sheets to their backing plates shall be capable of resisting the frictional force set up in the bearing. Welding shall be in accordance with AWS D1.5. The backing plates shall extend beyond the edge of the stainless steel sheets to accommodate the welds and the welds shall not protrude above the stainless steel sheets. It is essential that stainless steel sheets remain in contact with base metal throughout their service life such that interface corrosion cannot occur.
7. The stainless steel sheets shall face downward and shall completely cover the PTFE sheets in all operating positions, plus one additional inch in the direction of movement. The surfaces in contact with the PTFE shall be finished to a smoothness of 20 microinch rms or less.
8. Brass Sealing Rings for Pot Bearings. Flat brass sealing rings shall have a minimum width of 0.375 inch. The thickness of the rings shall be a minimum of 0.09375 inches. The number of rings shall be a minimum of 3 depending on the design load of the bearing. The rings shall be finished to a smoothness of 63 micro-inch (rms) or less.
9. The gap between the ring and the wall shall nowhere exceed 0.01 inches. Each ring shall have one vertical cut at 45° to the tangent with a maximum gap of 0.05 inches. The gaps shall be staggered a minimum of 90° relative to one another when the rings are in place.
10. PTFE Sheets. PTFE sheets shall be a minimum of 0.125 inch thick, epoxy-bonded into a square-edged recess of a depth equal to one-half the PTFE sheet thickness. The shoulders of the recesses shall be sharp and square. After completion of the

bonding operation the PTFE surfaces shall be smooth and free from blisters and bubbles.

11. Allowable pressures on Unfilled PTFE sheets on primary sliding surfaces (excluding guide bars) shall be as follows:

a. Design Load Effect	Allowable Contact Pressure
b. Avg. Stress (All Loads)	4500 psi
c. Edge Stress (All Loads)	5500 psi
12. The allowable average stress on Unfilled PTFE on guide bar surfaces shall be 4500 psi. The use of alternative low coefficient of friction material shall be allowed for guide bar surfaces.
13. Elastomeric Disc for Pot Bearings. All elastomeric discs shall be individually molded in one-piece. No layering or stacking of discs will be permitted. Cuts, gouges or nicks from machine cutting or flash trimming will be cause for rejection.
14. The sealing groove shall be molded integrally. It shall be square to the pad top surface and the same nominal dimensions as the brass sealing rings.
15. The area of the pad shall be designed to limit the average bearing pressure on the pad to 3500 psi under the design loads.
16. Shop Inspection The engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly, testing and painting of the bearings.

1.5 IDENTIFICATION, STORAGE AND HANDLING

- A. Identification - Each bearing shall be stamped with the manufacturer's name, bearing type or model number, bearing number, and the installed location. The stamp shall be on a surface visible after installation.
- B. Storage - All bearings, whether in the fabrication shop or an independent warehouse shall be stored in a clean, dry, covered facility. When in storage the bearings will be kept banded, wrapped, and secured in a condition suitable for shipment.

PART 2 - PRODUCTS

2.1 MATERIALS

Materials shall conform to the following standards:

- A. Steel Plate: ASTM A36, A588 or A572.
- B. Stainless Steel: ASTM A240, Type 304, no. 8 finish.
- C. Brass for Sealing Rings: ASTM B36, half-hard alloy 260.
- D. Polytetrafluoroethylene (PTFE): PTFE shall be manufactured from pure virgin unfilled TFE resin conforming to ASTM D1457. PTFE shall be resistant to acids, alkalis and petroleum products; non-absorbing of water; stable from -360°F to +500°F; and nonflammable. It shall meet the following test requirements:

ASTM	Requirement	Test Method	(min.)
Physical Property			
Ultimate tensile strength		D1457	2800 psi
Ultimate elongation		D1457	200%
Specific Gravity		D792	2.12

Adhesive. Adhesive used for bonding sheet PTFE shall be an epoxy material stable from -100°F to +250°F.

Elastomer. The pot bearing elastomer shall be 100% virgin polychloroprene (neoprene). The elastomer shall be plain, not laminated or fiber reinforced. It shall meet the following test requirements:

Physical Property	ASTM Test Method	Requirement
Hardness, Shore A durometer	D2240	50±5
Tensile strength, min. p.s.i.	D412	2250
Ultimate elongation, min.	D412	400%
Aged properties after 70 hrs.	D573	
Temperature		212°F
Hardness change, max.		+15
Tensile strength change, max.		- 15%
Ultimate elongation change, max.		- 40%
Compression set after 22 hrs.	D395 (method B)	
Temperature		212°F
Compression set, max.		35%

2.2 FABRICATION TOLERANCES

A. Determination of Flatness and Tolerances Flatness of bearings after welding and fabrication shall be determined by the following method:

1. A precision straight edge that is longer than the nominal dimension to be measured shall be placed in contact with the plate surface to be measured.
2. Select a feeler gauge with a thickness corresponding to the flatness tolerances in item 4. below, and having a tolerance of ± 0.001 " and attempt to insert it under the straightedge.
3. Flatness is acceptable if the feeler does not pass under the straightedge.
4. Flatness tolerances are arranged in the following classes:
 - a. Class A: 0.001" x "Nominal Dimension"
 - b. Class B: 0.002" x "Nominal Dimension"
 - c. Class C: 0.005" x "Nominal Dimension".
5. "Nominal Dimension" shall be interpreted as the actual dimension of the plate, in inches, under the straightedge.

B. Rotational Elements

1. The inside diameter of pots shall be machined to a tolerance of ± 0.003 . The tolerance on the depth of pot cavity shall be +0.025", -0". The tolerance on the thickness of the pot base shall be ± 0.025 ", -0".
2. The underside of pots shall be machined parallel to the inside and to a class "C" tolerance.
3. Elastomeric disc tolerances shall be:
 - a. Diameters, -1/16", + 0.0"
 - b. Thickness, -0", +1/8"

4. Piston tolerances shall be:
 - a. Diameters, ± 0.003 "
 - b. Thickness $+0.025$ ", $- 0$ "
 - c. Sliding side, Class "C" tolerance; elastomer side, Class "C" tolerance. Piston flanges (if any): thickness $+1/8$ ", $-1/32$ "; diameter $+1/8$ ", $-1/32$ ".

C. Non-Rotational Elements

1. Masonry and distribution plate tolerances shall be:
 - a. Plan dimensions, ± 0.25 "
 - b. Thickness tolerance shall be ± 0.0625 "
 - c. Class "C" tolerance for the underside and Class "A" tolerance for the upper side in contact with other bearing components.
2. Sole plates shall conform to:
 - a. Plan dimensions, ± 0.25 "
 - b. Center line thickness, ± 0.063 "
 - c. Class "B" tolerance for the upper side and Class "A" tolerance for underside (i.e., side contacting stainless sliding surface) in contact with other bearing components.
3. Guide bar tolerances shall be:
 - a. Length, $\pm 1/8$ "
 - b. Section dimensions, $\pm 1/16$ "
 - c. Flatness where it bears on another plate Class "A"
 - d. Bar-to-bar, nominal dimension, $+0.030$ ", -0.0 " and ± 0.005 radians out of parallel.
4. Overall bearing height shall not vary from nominal height dimension by $+0.25$ ", -0.0 ".

2.3 PAINTING OR METALIZING

- A. The bearing assemblies shall be painted or zinc metalized in accordance with AWS C2.18 -93. Galvanizing will not be permitted. The surfaces to be painted or metalized are shown in the working drawings. The pot cavity and all surfaces covered by stainless steel or PTFE sheet are not painted or metalized.

2.4 SAMPLING, TESTING, AND INSPECTION

- A. Sampling, testing, and inspection shall be performed on a number of bearings consistent with the applicable governing agency's sampling requirements. All testing shall be performed in the presence of a representative of the applicable governing agency or its designated inspection agency. Two separate tests can be performed. The first test will be conducted on all bearing types (fixed, mobile and guided) with the bearing loaded to 150 percent of the vertical design capacity at the design rotation. The second test will measure the coefficient of friction on a representative sliding bearing (mobile and guided). During this test, the bearing should be loaded to 100 percent of the vertical design capacity while measuring the coefficient of friction. Finally, the third test will be conducted on fixed and guided bearing assemblies to verify the horizontal load carrying capacity. During this test, the bearing should be loaded to 100 percent of the vertical design capacity while a horizontal load equal to 150 percent of the horizontal load capacity is applied to the assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.2 PREPARATION

- A. Examine the contract documents in order to insure the completeness of work requirements under this section.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this section and work of related trades.

3.3 INSTALLATION

- A. Bearings shall be installed in strict accordance with the manufacturer's instructions, as approved by the design engineer. The manufacturer will have its technical representative present for the placement of the first bearing. At the option of the manufacturer or the design engineer, the technical representative may be required to be present for the placement of any number of additional bearings. Measures shall be taken to limit the rotation of the bearing to maximum design rotation during construction.

END OF SECTION

SECTION 062000

CARPENTRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the carpentry work as shown on the drawings and/or specified herein, including but not limited to, the following:
 - 1. Blocking and miscellaneous wood, including plywood wall lining for telephone and electric closets.
 - 2. Rough hardware.
 - 3. Installation only of finish hardware.
 - 4. Installation only of doors and hollow metal frames.

1.3 RELATED SECTIONS

- A. Architectural woodwork - Section 064023.
- B. Roofing - Section 075419.
- C. Steel doors and frames - Section 081113.
- D. Finish hardware - Section 087100.

1.4 QUALITY ASSURANCE

- A. Lumber Standard: Comply with PS 20.
- B. Plywood Standard: Comply with PS 1 and American Plywood Assoc. (APA).
- C. Shop fabricate carpentry work to the extent feasible and where shop fabrication will result in better workmanship than feasible for on-site fabrication.
- D. Grade Marks: Identify lumber and plywood by official grade mark.
 - 1. Lumber: Grade stamp to contain symbol of grading agency certified by Board of Review, American Lumber Standards Committee, mill number or name, grade of

lumber, species grouping or combination designation, rules under which graded where applicable, and condition of seasoning at time of manufacture.

- a. S-Dry: Maximum nineteen (19) percent moisture content as per ASTM D. 2016.
- b. MC-15 or KD: Maximum of fifteen (15) percent moisture content.

1.5 SUBMITTALS

- A. Pressure Treatment: Include certification by treating plant stating chemicals and process used, net amount of salts retained and conformance with applicable standards.
- B. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

1.6 PRODUCT HANDLING

- A. Deliver carpentry materials to the site ready to use with each piece of lumber clearly marked as to grade, type and mill, and place in an area protected from the elements.
- B. Deliver rough hardware in sealed kegs and/or other containers which shall bear labels as to type and kind.
- C. Pile lumber for rough usage, when delivered to the site in stacks to insure drainage and with a minimum clearance of six (6) inches above grade. Cover stacks with tarpaulins or other watertight coverings. Store grounds and similar small sized lumber inside the building as soon as possible after delivery.
- D. Do not store seasoned lumber in wet or damp portions of the building.
- E. Protect fire retardant treated materials against high humidity and moisture during storage and erection.
- F. Remove delivered materials which do not conform to specified grading rules or are otherwise not suitable for installation from the job site and replace with acceptable materials.
- G. All items specified in Section 087100 of this specification entitled "Finish Hardware" shall be received, accounted for, stored and applied under this Section.
- H. Hardware shall be sorted and stored in space assigned by Contractor and shall be kept at all times under lock and key. The safety and preservation of all items delivered will be the responsibility of the Contractor.

1.7 JOB CONDITIONS

- A. Installer must examine the substrates and supporting structure and the conditions under which the carpentry work is to be installed, and notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer and the Architect.

- B. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

PART 2 PRODUCTS

2.1 WOOD MATERIAL

A. General

1. All wood shall be sound, flat, straight, well seasoned, thoroughly dry and free from all defects. Warped or twisted wood shall not be used.
2. For miscellaneous wood blocking, grounds, furring as required, use Utility Grade Coastal Douglas Fir or Southern Pine, free from knots, shakes, rot or other defects, straight, square edges and straight grain, air seasoned with maximum moisture content of nineteen (19) percent. Wood shall be S4S, S-Dry, complying with PS-20.
3. Plywood and rough carpentry for telephone and electric closets, provide 3/4" thick C-D EXT-APA plywood, fire retardant treated as specified herein.

B. Wood Treatment

1. All interior wood material specified herein shall be fire retardant treated to comply with the AWP standards (C20 for lumber, C27 for plywood) for pressure impregnation with fire retardant chemical to achieve a flame spread rating of not more than 25 (UL Class "FR-S") when tested in accordance with UL Test 723 or ASTM E 84. The fire retardant chemicals used to treat the lumber must comply with FR-1 of AWP Standard P17 and be free of halogens, sulfates and ammonium phosphate.
 - a. After treatment, kiln dry to a moisture content of fifteen (15) percent; if wood is to be painted or finished, kiln dry to a moisture content of twelve (12) percent. Treatment shall be equal to "Dricon" made by Arch Wood Protection Inc. or approved equal. Provide UL approved identification on treated materials.
2. For exterior blocking, roofing and sheet metal, pressure treat wood with copper azole, Type A (CBA-A); ammoniacal copper quat (ACQ) or similar preservative product that contains no arsenic or chromium. Preservative shall comply with AWPB Standard C-2 for lumber and C-9 for plywood, (.25 lbs./cubic foot of chemical in wood).
 - a. After treatment, kiln dry to a maximum moisture content of fifteen (15) percent. Treatment shall be equal to "Wolmanized Natural Select" made by Arch Wood Protection Inc. or approved equal.
3. Treated wood which is cut or otherwise damaged shall be further treated in accordance with the AWP Standard M-4.

2.2 HARDWARE

- A. Rough Hardware for Treated Woods and Exterior Use: Hot-dipped galvanized or Type 304 stainless steel.
- B. Nails: Common steel wire, untreated for interior work as per Fed. Spec. FF-N-105.
- C. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers or carriage bolts with square nuts and cut washers conforming to the following:
 - 1. Bolts: FS-FF-B-575 and 584.
 - 2. Nuts: FF-N-836D.
 - 3. Expansion Shields: FS-FF-B-561.
 - 4. Toggle Bolts: FS-FF-B-588.
 - 5. Lag Screws and Bolts: FS-FF-B-561.
- D. Wood Screws: Per Fed. Spec. FF-S-111D.
- E. Concrete and Masonry Anchors: Standard expansion-shield self-drilling type concrete anchors where so shown or noted on the drawings, or where approved by the Architect.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where carpentry is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION OF FINISH HARDWARE

- A. All finishing hardware specified in Section 087100 of this specification entitled "Finish Hardware" shall be received, accounted for, stored and applied under this Section.
- B. Hardware shall be sorted and stored in space assigned by Contractor and shall be kept at all times under lock and key. The safety and preservation of all items delivered will be the responsibility of the Contractor.
- C. Hardware shall be carefully fitted and securely attached, in accordance with these specifications and the instructions of the various manufacturers.
- D. Unless otherwise noted, mount hardware units at heights established in Section 081113.
- E. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item

completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.

- F. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- G. Drill and countersink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- H. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.
- I. All keys used shall be construction keys which are to be tagged with fiber discs as approved, clearly labeled with identifying inscriptions and then neatly arranged in a temporary cabinet. All construction keys shall be returned to the Owner.
- J. Adjusting and Cleaning
 - 1. Adjust and check each operating item of hardware and each door, to ensure proper operation and function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite type if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.
 - 2. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.3 INSTALLATION OF DOORS AND FRAMES

A. Preparation

- 1. Remove welded-in shipping spreaders installed at factory.
- 2. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

- d. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
3. Drill and tap doors and frames to receive non-templated mortised and surface-mounted door hardware.

B. Installation

1. General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
2. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Install frames in accordance with ANSI 250.11-20001, Recommended Erection Instructions for Steel Frames, unless more stringent requirements are specified herein.
 - b. At fire-protection-rated openings, install frames according to NFPA 80.
 - c. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - d. Install frames with removable glazing stops located on secure side of opening.
 - e. Frames set in masonry walls shall have door silencers installed in frames before grouting.
 - f. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - g. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames conforming to the requirements of Section 072100 - "Thermal Insulation."
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar; refer to Section 042000 - "Unit Masonry" for installation of frames in masonry walls.
6. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

7. In-Place Gypsum Board Partitions: Secure frames in place with post-installed expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
 9. Installation Tolerances: Adjust steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
 10. Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - a. Non-Fire-Rated Standard Steel Doors:
 - 1). Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - 2). Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - 3). Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - 4). Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - b. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 11. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with standard steel door and frame manufacturer's written instructions.
 - a. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner.
- C. Adjustments: Check and readjust operating finish hardware items just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise unacceptable.
- 3.4 BLOCKING AND MISCELLANEOUS WOOD
- A. General
1. Erect rough carpentry true to line, levels and dimensions required; squared, aligned, plumbed, and securely fastened in place.

2. Shim where required to true up furring, blocking and the like. Use wood or metal shims only.
3. Do all cutting, fitting, drilling and tapping of other work as required to secure work in place and to perform the work included herein. Do all the cutting and fitting of carpentry work, for the work of other trades as required.

B. Blocking and Miscellaneous Wood

1. Furnish and install all wood grounds, furring, blocking, curbs, bucks, nailers, etc., that may be necessary and required in connection with the carpentry and with the work described for any other trades and including required carpentry for electrical fixtures. All blocking and nailers shall be continuous wherever required, whether or not so indicated.
2. Blocking shall be as required for the proper installation of the finished work and for items in mechanical sections as required. Blocking, edgings, stops, nailing strips, etc., shall be continuous, unless distinctly noted otherwise. Provide blocking as required to install all equipment. Provide blocking and nailers where shown or required to fasten interior sheet metal work.
3. Fastening for wood grounds, furring and blocking shall be of metal and of type and spacing as best suited to conditions. Hardened steel nails, expansion screws, toggle bolts, self-clinching nails, metal plugs, inserts or similar fastenings shall be used, of suitable type and size to draw the members into place and securely hold same.

C. Rough Lumber for Roofing and Sheet Metal

1. Furnish and install all wood nailing strips and wood blocking required in connection with respective types of roofing, fans, flashings, and sheet metal work, using preservative treated wood as herein before specified.
2. Wood blocking shall be of sizes and shapes as indicated on the drawings and/or designed for the reception of curb flashings for roof ventilators and similar items.
3. All nailing strips and blocking shall be carried out in accordance with the printed installation instructions, and/or recommendations of the accepted manufacturer of the roofing materials, and in coordination and cooperation with the sheet metal work trades.
4. All blocking and nailing strips shall be firmly secured in place using counter bored bolt and nut fastenings, or secured by any other proposed flush surfaced fastenings.
5. Wood nailing strips or blocking required to be embedded in concrete work shall be furnished in time due for placing, prior to start of concrete operations. Locations and spacings of nailing strips or blocking shall be performed in coordination with the concrete trades, as required for respective installations.

3.5 TELEPHONE AND ELECTRIC EQUIPMENT MOUNTING BOARDS

- A. Furnish and install 3/4" thick plywood panels to the walls of the telephone and electric equipment rooms in accordance with the requirements of the local utility company.
- B. Secure to wall using proper devices for substrates encountered, spaced twelve (12) inches o.c., maximum around the edges, 1-1/2" from corners, and in three (3) rows of three (3) each in the field. Recess fastening devices flush with the plywood surface. Adjacent panels shall be butted with 1/16" space between without lapping.

3.6 ROUGH HARDWARE

- A. Securely fasten rough carpentry together. Nail, spike, lag screw or bolt as required by conditions encountered in the field and the Contract Documents.
- B. Provide rough or framing hardware, such as nails, screws, bolts, anchors, hangers, clips, inserts, miscellaneous fastenings, and similar items of the best quality and of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner.
- C. Secure rough carpentry to masonry with countersunk bolts in expansion sleeves or other acceptable manner, with fastenings not more than sixteen (16) inches apart. Secure woodwork to hollow masonry with toggle bolts spaced not more than sixteen (16) inches apart.
- D. Countersink bolts in nailers and other rough woodwork and include washers and nuts. Cut bolts off flush with surfaces and peen as may be required to receive finished work.
- E. Inserts to secure wood nailers to concrete shall be malleable iron threaded inserts with 3/8" diameter bolts of length to allow for countersinking. Locate at end of each nailer and at intervals not exceeding thirty (30) inches o.c.
- F. Furnish to the mason for building into the work, or attaching the work which is to be built in, anchors, bolts, wall plates bolted to masonry, corrugated wall plugs, nailing blocks, etc., which are required for the proper fastening and installation for the work or other items as called for in this Section.
- G. Detailed instructions with sketches of necessary requirements, shall be given to the masonry trade showing the location and other details of such nailing devices.

3.7 CLEANING UP

- A. General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends and debris.
- B. Sweeping
 - 1. At the end of each working day, or more often if necessary, thoroughly sweep all surfaces where refuse from this portion of the work has settled.
 - 2. Remove the refuse to the area of the job site set aside for its storage.

3. Upon completion of this portion of the work, thoroughly broom clean all surfaces.

END OF SECTION

SECTION 064023

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the architectural woodwork as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Wood millwork and counters with wood veneers.
 - 2. Wood millwork and counters with plastic laminate finish.
 - 3. Hardware for millwork.
 - 4. Wood framing and rough lumber as required for work of this Section.
 - 5. Wood grounds, blocking, nailers, furring as required for work of this Section.
 - 6. All rough hardware and fastenings for work of this Section.
 - 7. Drilling concrete and masonry, drilling and/or tapping metal work, as required, for the installation of work of this Section.
 - 8. Back painting as specified herein.
 - 9. Shop finish of work of this Section, except items indicated herein to be shop primed only.

1.3 RELATED SECTIONS

- A. Carpentry - Section 062000.
- B. Caulking between architectural woodwork and any wall, floor, or ceiling joints - Section 079200.
- C. Field finishing - Section 099000.

1.4 QUALITY STANDARDS

- A. The quality standards of the Architectural Woodwork Institute, "Quality Standards Illustrated," latest edition, shall apply to all workmanship for architectural woodwork

and by reference are made a part of this specification. All work shall conform to "Premium" grade requirements of the AWI "Quality Standards Illustrated," unless otherwise modified herein.

- B. In the event of a dispute as to the quality grade (or grades), all parties involved will call upon the Architectural Woodwork Institute for an inspection under AWI's established inspection procedures, and agree to abide by the decision of AWI. The cost of said inspection shall be borne by the Contractor.
- C. Employ only tradesmen experienced in the fabrication and installation of architectural woodwork.

1.5 SUBMITTALS

A. Shop Drawings

- 1. Submit shop drawings of all woodwork specified and indicated on the drawings. Shop drawings shall indicate room plans and elevations at 3/4" equals 1'-0" scale and typical construction details at 3" equals 1'-0" scale. Shop drawings shall indicate all materials, thicknesses and finishes.
- 2. Shop drawings shall show all finish hardware, anchors, fastenings and accessories.
- 3. Shop drawings shall show all jointing, joint treatment and butt jointing in veneers and plastic laminate.

B. Samples: Submit samples of each of the following items:

- 1. Plastic laminate, twelve (12) inches square, including a section of outside corner.
- 2. Transparent finish for each species of wood veneer laminated to particleboard, twelve (12) inches square, for each finish specified or shown.
- 3. Cabinet hardware.

1.6 QUALIFICATIONS

- A. The work of this Section shall be provided by a firm having a minimum of five (5) years' experience on projects of similar size and quality to that specified and shown.

1.7 COORDINATION

- A. Coordinate the work of this Section with other appropriate Sections of the specifications to insure proper scheduling for fabrication and installation of the work specified herein.
- B. Coordinate with partition and finish trades to insure that proper provisions are made for the installation of the work specified herein.
- C. Verify all dimensions in the field prior to fabrication of all Architectural Woodwork to assure proper fit.

1.8 PRODUCT HANDLING

- A. All materials and work of this Section shall be protected from damage from time of shipment from shop to final acceptance of work. Cover, ventilate, and protect work of this Section from damage caused by weather, moisture, heat, staining, dirt, abrasions, any other causes which may adversely affect appearance or use, or which may cause deterioration of finish, warping, distortion, twisting, opening of joints and seams, delamination, loosening, etc., of work of this Section.
- B. Keep all finish carpentry, millwork, and cabinet work under cover both in transit and at the premises. Do not deliver any finish carpentry, millwork or cabinet work before it is required for installation. Protect such work to avoid damage in transit, during erection and after erection until acceptance of the building; use all such methods to provide the proper protection. Remove such protection when directed by the Architect.
- C. Deliver finish carpentry, millwork, and cabinet work in a dry stable condition; protect same against injury and dampness. Do not store or install finish carpentry, millwork or cabinet work until after the concrete, masonry and plaster work are thoroughly dry.
- D. Damaged or defective items of work of this Section are subject to rejection and replacement with new by Contractor, at no cost to Owner.

1.9 JOB CONDITIONS

- A. Humidity Controls: The ambient relative humidity at the site, including both the storage and the installation areas, shall be maintained between 25% and 55% prior to delivery and through the life of the installation.
- B. Determine equilibrium moisture content and maintain required temperature and relative humidity as required for a tolerance of plus or minus one (1) percent of the specified optimum moisture content until woodwork receives specified finishes. Refer to "Guide to Wood Species Selection," AWI, for method of determining equilibrium moisture content values.
- C. Examination of Substrate and Conditions: The installer must examine the substrate and the conditions under which the work of this Section is to be performed, and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with work under this Section until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- D. Areas to receive architectural woodwork must be fully enclosed with windows and/or curtain wall installed and glazed, exterior doors in place, HVAC systems operational, and temporary openings closed. Any plaster, wet grinding and concrete work shall be fully dry.
- E. Architectural woodwork shall be allowed to come to equilibrium on site for 7 days prior to installation.

PART 2 PRODUCTS

2.1 BASIC REQUIREMENTS

- A. Wood Moisture Content: Provide kiln-dried (KD) lumber with an average moisture content range of nine (9) to twelve (12) percent for exterior work and six (6) to eleven (11) percent for interior work.
- B. Measurements: Before proceeding with woodwork required to be fitted to other construction, obtain field measurements and verify all dimensions of shop drawing details as required for accurate fit.
- C. Compatibility of Grain and Color: Architect reserves the right to select materials for best compatibility between visually related members and veneers.
- D. Machine and sand woodwork to comply with requirements of Standards for specified grade.
- E. Fabricate woodwork to dimensions, profiles and details shown. Rout or groove back of flat trim members, kerf backs of other wide flat members except plywood or veneered members.
- F. Miter joints by joining, splining and gluing to comply with requirements for the specified grade.
- G. Inspect each piece of lumber and plywood or each unit of woodwork after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

2.2 GENERAL - MATERIALS

- A. Softwood lumber shall conform to the requirements of the latest edition of American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Association having jurisdiction, and shall bear the official grade and trademark of the Inspection Bureau of the Association and a mark of mill identification.
- B. Framing and Rough Lumber: No. 1 KD grade Southern Pine or Dense Construction grade Douglas Fir, having extreme fiber in bending stress of at least 1700 psi, surfaced four sides (S4S). Provide fire retardant treatment meeting requirements of Section 062000.
- C. Grounds, Blocking, Nailers, Furring: Southern Pine, Douglas Fir or Sitka Spruce, grade to suit particular purpose and to be straight, square edged, straight grained, surfaced four sides (S4S), and which will retain nails and screws without splitting. Provide fire retardant treatment.
- D. Plywood: AWI Section 200; Veneer core, particle or plywood core unless otherwise specified, and with the following requirements:
 - 1. Hardwood: Premium Grade, Section 200, face veneers as shown or specified. Grade A Sapele, Quarter sawn, stained to match sample provided by architect, no sapwood exposed, stained to match sample provided by architect.

2. Particleboard: Premium Grade, Section 200, fire retardant for wall paneling only equal to Duraflake FR and Duraflake for cabinets.
3. Edges: Banded with hardwood in accordance with Premium Grade Standards.
- E. Face Veneers for Transparent Finish: AWI Section 500, Premium Grade of species as selected by the Architect, Rift Sliced. Veneer must be flitch matched, sequence matched, book matched, end matched and centered balanced.
- F. Finishing (Wood)
 1. Transparent Finish
 - a. AWI Factory Finish System No. TR-2, catalyzed lacquer.
 - b. AWI Premium Grade.
 - c. Degree of Sheen: Dull satin.
 - d. Filled or Unfilled Finish.

2.3 PLASTIC LAMINATE

- A. Face Sheets: NEMA Publication LD3, Grade GP50, Type I, 0.05" thick, as manufactured by Formica, Nevamar, WilsonArt. Color, pattern and finish as selected by the Architect.
- B. Backing Sheets: Non-decorative, high-pressure plastic laminate, NEMA LD3, Grade BK20, 0.02" thick.
- C. Edges: Finish with plastic laminate to match face and applied before face sheets are applied, unless otherwise shown or specified.

2.4 METAL

- A. Steel
 1. Structural Steel Shapes and Plates: ASTM A 36.
 2. Hot-Rolled Carbon Steel Sheets: Commercial quality, ASTM A 569, may be used for concealed parts only. Galvanize sheets for planters.
 3. Primer for Unexposed Metal: Zinc chromate primer.

2.5 MISCELLANEOUS PRODUCTS

- A. Fasteners
 1. Wood Screws: FS FF-S-111, type, size, material and finish as required for the condition of use.
 2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.
 3. Anchors: Type, size, material and finish as required for the condition of use.

4. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.

B. Adhesives

1. For Laminating Plastic Laminate Surfaces: Melamine, phenol-resin, or resorcinol-resin complying with FS MMM-A-181; type, grade and best suited for the purpose.
2. For All Other Uses: Moisture resistant complying with FS MMM-A125, Type II, or MMM-A-188, Type I II or III.

2.6 CABINETS WITH PLASTIC LAMINATE FINISH

A. General

1. Fabricate all cabinetry and millwork to the "Premium Grade" standards of the AWI, Section 400.
2. Face construction of cabinets shall be "Flush Overlay."
3. Provide 3/4" thick doors, drawer fronts and fixed panels (including thickness of plastic) except where required to be thicker by Standards; and provide flush units.
4. Provide dust panels of 1/4" thick plywood or tempered hardboard above compartments and drawers, except where located directly below countertops.
5. Exposed Edges: Plastic laminate matching exposed panel surfaces. Ease exposed edge of overlap sheet.

B. Plastic Laminate

1. Plastic Laminate for Horizontal Surfaces: 0.050" thick, general purpose type (high pressure).
2. Plastic Laminate for External Vertical Surfaces: 0.028" thick, general purpose type (high pressure).
3. Plastic Laminate for Post Forming: 0.042" thick, post forming (high pressure).
4. Plastic Laminate for Cabinet Linings: 0.020" thick, cabinet liner (high pressure).
5. Plastic Laminate for Concealed Panel Backing: 0.020" thick, backer type (high pressure).
6. Plastic Laminate Colors and Patterns: As selected by the Architect from manufacturer's standard satin finish products. Acceptable Manufacturers: WilsonArt, Nevamar, Formica.

- C. Shop Assembly: All work shall be shop assembled. Work that is too large for entrance into the use area shall be fabricated in attachable sections with provisions for reconnection in the using space.

- D. Material Thicknesses: See drawings for general materials thicknesses. Minimum thickness of solid lumber for web frames, trim, bases, etc., shall be 3/4". Minimum thickness of plywood and particleboard shall be 3/4".
- E. Sizes: See drawings for woodwork sizes required. The manufacturer shall check field dimensions and verify all openings and actual field conditions prior to fabrication of work.
- F. Manufacturer is responsible for rigidity and structural stability.

2.7 PLASTIC LAMINATE COUNTERTOPS

- A. Grade: Same as AWI grade required for cabinet work; plastic laminate finish.
- B. Construction
 - 1. Provide back-splash and end-splash, where detailed; top-mounted square butt joint, fully covered with matching plastic laminate, eased edges.
 - 2. Exposed Counter Edges: Plastic laminate matching surface, except as otherwise indicated. Ease exposed edges of overlap sheet.
 - 3. Cut openings for equipment to be installed. Comply with equipment manufacturer's requirements, but provide internal corners of 1/8" minimum radius. Smooth saw cut and ease edges.
 - 4. Seal cut edges of counter at openings for sinks and other "wet" equipment, using waterproofing compound recommended by plastic manufacturer and compatible with laminating adhesive.

2.8 BUILT-IN CABINETS, WOODWORK WITH WOOD VENEER FINISH

- A. Construction: Details of cabinet and wood work construction shall conform to design as detailed on the drawings and shall be constructed in accordance with AWI Section 400, Premium Grade.
- B. Finishing: All work shall be factory pre-finished. No field finishing will be permitted, except minor retouching that is necessary after installation to leave work in perfect condition. Field touch-up shall be accomplished using the same finishes as originally applied at the factory. All finishes shall be free from runs, sags and other visual defects. All wood shall be thoroughly hand smoothed and hand sanded to remove all traces of machine and tool marks. All steel or other metal components shall be deburred, thoroughly cleaned and degreased prior to finishing. Requirements for surface preparation shall be in accordance with AWI Standards specified. Surfaces shall be finished as follows:
 - 1. Grade A Walnut, no sapwood exposed.
 - 2. Wood veneers shall be as specified herein, flitches to be selected by Architect. Veneer shall be minimum 1/28" thick.
 - 3. All wood veneer surfaces shall be given transparent finish as specified herein.

4. Backing Veneer: Provide backing veneer, of same thickness and strength as face veneer for balanced construction, where plywood surface not exposed, not semi-exposed, or not to be finished. Note that interior surface of cabinets, closets, are to be finished.
- C. Edge Banding: All visible edges of case and body members fabricated from plywood shall be banded. Transparent finished wood veneer panels shall be banded with wood species to match face veneers, no sapwood.

2.9 CABINET HARDWARE

- A. Architectural Woodwork Hardware: Provide the following items, or their approved equal, as required:
 1. Hinges: Hafele concealed hinges.
 2. Catches: Magnetic; top and bottom.
 3. Pulls: Selected by the Architect.
 4. Locks: Directed by the Architect.
 5. Drawer Slides: Accuride, Model 7434, full extension, 100 lb. capacity.
 6. Shelf Supports: Pin and grommet system equal to No. 282.01.701 pin and 282.50.704 grommet made by Hafele.
 7. Finish: Satin Stainless Steel.
 8. Closet Hardware: Oval wardrobe rails, chrome plated steel with center bracket and wall support brackets made by Hafele or approved equal.

2.10 FABRICATION - GENERAL

- A. Provide lumber framing for architectural woodwork, complete with all bracing and fastening devices as required for a rigid installation, and as required to sustain the imposed loads.
- B. Do all fabrication from field measurement with provision for scribing as required to meet built-in conditions.
- C. Coordinate the work of this Section with the work of other trades.
- D. Fabricate units in largest practicable sections. Assemble in the shop for trial fit, disassemble for shipment and reassemble with concealed fasteners.
- E. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.
- F. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered providing they comply with the Contract Documents, maintain the profiles shown and subject to acceptance by the Architect.

- G. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.
- H. Factory finish all items where possible. Defer final touch-up, cleaning and polishing until after delivery and installation.
- I. Comply with AWI Section 1500, Premium Grade for sanding, filling countersunk fasteners, back priming and similar preparations for the finishing of architectural woodwork, as applicable to each unit of work.
- J. Prepare all countersunk wood screw attachments for wood plugs. Wood plugs shall match surrounding species and grain direction; putty filling is not acceptable.

2.11 FABRICATION - MILLWORK

- A. Provide millwork in accordance with AWI Section 400, Premium Grade.
- B. Include all preparations for mechanical, electrical, telephone and plumbing work required.
- C. Provide cabinet hardware for millwork as shown.
- D. Provide dust panels in body webs and between drawer units.
- E. Provide wood veneers for exposed surfaces as specified herein before.
- F. Hollow core doors will not be permitted.
- G. Provide matching veneers for edge treatments of case body members where transparent finishes are indicated or specified.
- H. Provide drawers with slides as specified. Drawers shall not rest on web body frames.
- I. Provide wood veneers for transparent finish, of matching and continuing grain, for drawer and door edges.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where architectural woodwork is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 FRAMING

- A. Use specified framing lumber, sizes and spacing as indicated on drawings and as required to support loads.

- B. Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, rigidly secured in place at bearings and connection with nails, lag screws and/or bolts as required by conditions.

3.3 GROUND, BLOCKING, NAILERS AND FURRING

- A. Provide all wood grounds, blocking, nailers, furring, and the like for work of this Section, where shown and where required, dressed to size indicated or required to suit the condition. Install grounds, blocking, nailers, furring, etc., rigidly, in proper alignment, trued with a long straight edge.

3.4 ROUGH HARDWARE

- A. Provide all rough hardware, such as nails, screws, bolts, anchors, hangers, clips and similar items. Hardware shall be of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner. Use galvanized hardware at exterior walls, and at other locations where subject to moisture or where water will be present.
- B. Secure wood to concrete and to solid masonry with countersunk bolts in expansion sleeves or other approved manner, to steel with countersunk bolts, to hollow masonry and to drywall with heavy duty countersunk toggle bolts. Space fastenings not more than sixteen (16) inches apart. Hardened cut nails, power-driven fastenings, or other suitable devices may be used where approved by the Architect.
- C. Connections and fastenings shall be made in such manner as will compensate for swelling and shrinkage and shall permit the work to remain permanently in place without any splitting or opening of joints.

3.5 INSTALLATION OF CABINET FINISH HARDWARE

- A. All items of finish hardware furnished under this Section shall be carefully fitted and secured in place as part of the work of this Section. Locations and positioning of hardware shall be subject to the Architect's approval. Care shall be taken not to mar or damage hardware, or other work. Install doors plumb and true. Hardware shall be fitted to assure operation without forcing.
- B. After preliminary fitting of hardware, the Contractor shall remove trim for painting and finishing work; after which he shall reinstall the hardware in a permanent manner.
- C. Upon completion of the work, before final acceptance of the building by the Owner, the Contractor shall, in the presence of the Architect, show that all hardware is in satisfactory working order; fit all keys in their respective locks and, upon acceptance of the work, shall tag and deliver all keys to the Architect and Owner.
- D. When directed by the Owner, at any time during the first year after the completion of the Contract, the Contractor shall return to the building and adjust and refit the work and hardware, and leave such items in satisfactory working order.

3.6 GENERAL INSTALLATION

- A. General: Installation shall conform to the requirements of Section 1700 of AWI "Quality Standards Illustrated," 8th Edition.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops), and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offset in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.

3.7 CABINET WORK AND MILLWORK

- A. General
 - 1. Materials and workmanship shall conform to the Quality Standards of the Architectural Woodwork Institute specified herein and to the drawings.
 - 2. Cabinet work and millwork shall be performed by experienced cabinet work and millwork company, having craftsmen skilled in their trade.
 - 3. Fabricate all cabinet work and millwork completely in the shop, in complete and/or as large units as practical, leaving only fitting, assembly, installation and a minimum of fabrication and finishing to be done at the building. Assembled work shall be rigidly secured and permanently fastened together with concealed fasteners.
 - 4. Afford Architect every facility for inspection of work at shop or mill at such times as the Architect may select.
 - 5. As far as practicable, use concealed fastenings for joining and assembling the work. Where this is impossible, the means of securing shall be placed in inconspicuous places and methods of joining and assembling submitted for Architect's approval prior to fabrication.
 - 6. Mill all finish wood accurately to detail, with clean cut moldings, profiles and lines, machined, sanded smooth, housed, jointed, blocked, put together in the best manner, with provision for swelling and shrinkage, and to assure the work remaining in place without warping, splitting or opening of joints.
 - 7. Cut trim to dimensions and profiles shown, from solid stock.
 - 8. Make all trim and the like in single lengths wherever possible; joints mitered, glued and splined. Continuous members shall have tight flush joints, doweled or splined and glued.

9. Make all joints hairline tight, fitted accurately and joined with hardwood splines or dowels, glued together, or by other method approved by Architect. Use screws, not nails, for fastenings.
 10. Gluing shall, where practicable, be by the hot plate press method and glued surfaces shall be in close contact throughout. Glue stains on finished work will not be permitted.
 11. Cover surface fastenings, where permitted, with matching wood plugs or wood putty. Finish exposed edges of plywood with matching solid stock. Lock miter external corners; tongue and groove internal corners to allow for contraction and expansion.
 12. Machine sand with grain, finish with hand sanding, leave exposed surfaces free from machine or tool marks that will show through the finish.
 13. Work which adjoins drywall, concrete, or other finish shall be fitted and scribed in a careful manner and ample allowance shall be given for cutting and scribing.
 14. Erect work true to lines, levels and dimensions, square, aligned and plumb, securely and rigidly fastened in place.
- B. Cabinet Work: Provide all items of cabinet work indicated on drawings and as herein specified.
1. Tops, sides, backs, bottoms, dividers, shelves, fronts, doors and drawer fronts shall be of plywood or flakeboard core, with the specified wood veneer or plastic laminate as indicated on drawings.
 2. Drawer sides and backs shall be 1/2" thick solid clear selected white birch, suitable for clear finish. Drawer bottom shall be 3/8" thick plywood with clear selected white birch veneers, suitable for clear finish.
 3. Cabinet doors and drawers shall be flush mounted.
 4. Adjustable shelves in cabinets shall have grommets spaced 2" o.c.
 5. Fixed shelves shall be dadoed into side supports and glued.
 6. Shelves shall be 3/4" thick for spans up to 30"; for spans in excess of 30" to 48" shelves shall be 1" thick.
 7. All cabinets shall have closed top, sides, bottom, and back with veneers to match face work. Cabinets to fit accurately into indicated locations; scribe moldings permitted only where indicated.
 8. Countertops, counters, counter fronts, shelves, etc., indicated on drawings to have plastic laminate, shall have plastic laminate shop applied to 3/4" thick core, with plastic laminate backing sheet on underside or back of countertops, counters and shelves. Plastic laminate shall be pressure laminated to core with laminate at external corners. Provide concealed wood framing to support plastic laminate counters, securely fastened to wall and to underside of counters.

3.8 PAINTING AND FINISHING

- A. Back-Painting: All work of this Section in contact with concrete or masonry or other moisture areas and all concealed surfaces of cabinet and millwork, shall be back-painted with one (1) coat of oil based paint prior to installation, shop applied where practicable.

3.9 CLEAN UP AND PROTECTION

- A. Clean Up: At regular intervals during the course of the work, all debris and excess material shall be cleaned up and removed from the site. Upon completion of installation, clean all spaces of debris caused by woodwork installation.
- B. Protection: Protect all woodwork from marring, defacement of other damage until final completion and acceptance of the project by the Owner. Repair or replace all defective units prior to final inspection as directed by the Architect. Any units that cannot be satisfactorily repaired in the opinion of the Architect shall be replaced with new units of same original design, at no additional cost to the Owner.

END OF SECTION

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SECTION 071616

CRYSTALLINE WATERPROOFING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the crystalline waterproofing as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
 - 1. Crystalline waterproofing system for inside surface of foundation walls and interior surfaces of concrete pits and trenches, including elevator pits.

1.3 RELATED SECTIONS

- A. Concrete - Section 033000.

1.4 SUBMITTALS

- A. Shop Drawings: Submit shop drawings showing details at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in waterproofing system.
- B. Product Data: Submit manufacturer's technical information and installation instructions for all materials of this Section.
- C. Contractor's Certification: Submit per Article 1.6.
- D. Subcontractor's Qualifications: Submit per Article 1.7.

1.5 STORAGE OF MATERIALS

- A. All materials shall be stored in their original tightly sealed containers or unopened packages; shall be clearly labeled with the manufacturer's name, brand name and number, and batch number of the material where appropriate.
- B. Materials shall be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.
- C. Material shall be stored out of the weather in a clean, dry area.

1.6 MANUFACTURER'S REPRESENTATIVE

- A. Contractor shall require representative of manufacturer of the waterproofing material to provide field instructions and supervision of the installation of the complete waterproofing system.
- B. Contractor shall require the manufacturer's representative to make sure that the subcontractor's workmen are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.
- C. Upon completion of the installation, the Contractor shall submit to the Architect a written certification that the representative of the manufacturer of the waterproofing material has supervised the work of this Section and that all materials are correctly installed.

1.7 QUALIFICATIONS OF SUBCONTRACTORS

- A. Subcontractors: All work of this Section shall be performed by a subcontractor who is approved by the manufacturer of the waterproofing material.
- B. Qualifications of Subcontractors: Subcontractors, in order to obtain Architect's acceptance for doing work of this Section, shall submit evidence of being bona fide waterproofing subcontractors, and that they are approved by the manufacturers of the waterproofing material for the installation of their material in accordance with the requirements of this Section. Subcontractor shall submit letter from manufacturer of waterproofing material stating that the subcontractor is approved by the manufacturer for the application of the waterproofing system specified for the Project. Letter shall certify that the subcontractor has satisfactorily applied the waterproofing system specified herein under manufacturer's supervision. Letter shall be on manufacturer's letterhead and shall be signed by an officer of the company.

1.8 WARRANTY

- A. The Contractor and manufacturer shall jointly warrant the waterproofing system executed under this Section to be watertight and free from defects in materials and workmanship for a period of ten (10) year from date of acceptance of this Contract, and that he, at his own expense, repair and/or replace all other work which may be damaged as a result of such defective work, and which becomes defective during the warranty period.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Waterproofing materials shall be a cement bond compound, free from chloride and iron oxide, which waterproofs by crystalline growth through the capillary tracts and shrinkage cracks in the concrete substrate equal to "Aqua-Fin IC," as manufactured by Aqua-Fin Inc., or equal made by Xypex Chemical Corp. or Anti-Hydro Co.
- B. Mixing Water: Potable.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where crystalline waterproofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Temperature Requirements: Surrounding temperatures shall be a minimum thirty-five (35) degrees F. for forty-eight (48) hours before, during and after installation.
- B. Preparation of Surfaces
 - 1. Surfaces to be waterproofed shall be clean and free of form scale, mould, laitance, oil, form release agents, curing compounds, hardeners, and any other materials likely to affect the bond penetration or performance of the waterproofing materials.
 - 2. Materials shall not be applied to frozen or frosted surfaces, nor during rain or snow.
 - 3. The presence of moisture in the concrete substrates is essential at the time of the waterproofing application. Should this not be the case, soak thoroughly all surfaces with water a day prior to the waterproofing, and remove all free laying water.
 - 4. All cracks in the concrete structure exceeding .01" in width and construction joints which have not been treated before with crystalline waterproofing, shall be routed out to a minimum depth of 3/4".
 - 5. Areas that have become dirty and concrete pours which have resulted in an extremely smooth surface shall be acid etched or, at the Contractor's option, may be sand blasted. Surfaces to be acid etched shall be dampened with clean water. Etching shall be done with a fifteen (15) percent hydrochloric (muriatic) acid. One gallon of acid should cover about fifty (50) to seventy-nine (79) square feet. Allow the acid to stand at least three (3) minutes and when bubbling ceases, flush off with water immediately. Do not let the acid stay on the surface for a prolonged period. When completed, the surface shall have a finish similar to fine or medium sandpaper. Surfaces which retain a smoothness or dirty condition shall be re-etched until the desired effect is obtained.
 - 6. Fill Form: Tie holes with "Aqua-Fin Mortar" of mortar consistency.
 - 7. Vertical Concrete Surfaces
 - a. Grind off all fins and other projections.
 - b. Extremely smooth surfaces must be etched or sand blasted.
 - c. Form ties with insets shall be removed. Chip back concrete approximately one (1) inch where form ties are without insets.

- d. Honeycombed Pockets and Faulty Construction Joints: Rout out all faulty materials back to sound concrete; clean and rinse thoroughly with water all surfaces to be treated; check by rubbing hand over the surfaces. Hand should not become wet.

C. Mixing of Crystalline Waterproofing Materials

1. Slurry Consistency: The crystalline waterproofing materials shall be delivered in powder consistency in original undamaged containers with manufacturer's labels and seals intact.
 - a. Separate container shall be used for measuring by volume the powdery crystalline waterproofing and the water.
 - b. Measure two (2) parts of crystalline waterproofing and 0.7 - 0.9 parts of water (depending on water or absorption of concrete).
2. Mortar Consistency for Seal Strips and Coves
 - a. Add water to crystalline waterproofing and/or crystalline waterproofing reinforcing proportion 1:2 and/or 1:3 and mix thoroughly until stiff consistency is reached.
 - b. Prepare only as much mortar as can be applied within ten (10) minutes.

D. Installation of Crystalline Waterproofing Materials

1. Slurry Application
 - a. Concrete surfaces to be treated with crystalline waterproofing shall be moist, not wet.
 - b. Crystalline waterproofing slurry coatings shall be applied with a stiff masonry brush or stiff broom and worked into every irregularity of the concrete surfaces.
 - c. Prior to the specified final application of crystalline waterproofing slurry coatings on the concrete surface, the following initial applications and repairs to the concrete structure have to be completed.
2. Construction Joints
 - a. Construction joints shall receive a slurry coating of crystalline waterproofing 2.5 lbs. per square yard immediately prior to each concrete pour. In areas where inaccessibility is difficult, apply 2.5 lbs. per square yard of crystalline waterproofing by dry sprinkle method immediately prior to the following pour or rout out to a minimum depth of 3/4".
 - b. Apply slurry coating of crystalline waterproofing 1.5 lbs. per square yard to routed out areas of cracks and construction joints and fill remaining depth with crystalline waterproofing and crystalline waterproofing reinforcing 1:6 in mortar consistency in two (2) laminating layers after each layer has reached its initial set (approximately 20-30 minutes).

3. Installation of Crystalline Waterproofing Coves (Junction Horizontal Surfaces and Walls): Apply slurry coating of crystalline waterproofing 1.5 - 2.0 lbs. per square yard, six (6) inches in width, and install a cove with crystalline waterproofing and crystalline waterproofing reinforcing 1:3 in mortar consistency.
 4. Honeycombed Pockets in Wall Areas: Rout out all faulty materials back to sound concrete. Apply slurry coating of crystalline waterproofing 1.5 lbs. per square yard over routed out area and fill with sand and cement mortar 1:3. If necessary (owing to depth) apply layers of mortar not exceeding 5/8" in thickness after each layer has hardened and repeat crystalline waterproofing slurry coating.
 5. Foundation and Pit Walls - Interior Face
 - a. Moisture treat vertical concrete surfaces thoroughly one day prior to application. Construction joints and form tie holes shall be filled with crystalline waterproofing and crystalline waterproofing reinforcing 1:6 in mortar consistency.
 - b. Apply two (2) slurry coatings on entire surface, consisting of "Aqua-Fin IC" crystalline waterproofing 1.25 lbs. per square yard per coating, to levels and on surfaces indicated. The second coating shall be applied while the first coating is green, normally within an hour or the application of first coating.
 6. Concrete Slabs – Pits: Apply Aqua-Fin IC at the rate of 2.5 lbs./sq. yd. in slurry consistency to concrete slab surfaces in one coat.
- E. Curing of Crystalline Waterproofing Application
1. Crystalline waterproofing applications while setting shall be protected from rain, frost and from drying out. During extreme hot weather, light water fog spraying may be necessary during time of application.
 2. Moisture treat crystalline waterproofing treated areas for minimum period of three (3) days starting the day following the completion of the crystalline waterproofing application with fog water spray. Surfaces shall have moist and later wet appearance for the duration of the curing period.
 3. Treated surfaces shall not be exposed to aggressive water, chemicals or acids until the applications have reached full strength (normally after 14 days).
- F. Crystalline Waterproofing with Painted Finish: All crystalline waterproofing surfaces to receive paint shall be neutralized with a solution of muriatic acid and water 1:8 (or vinegar salt water solution) after the crystalline waterproofing application has aged for a minimum period of two (2) weeks.
1. Rinse thoroughly with water all treated surfaces.

END OF SECTION

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SECTION 072100

THERMAL INSULATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the thermal insulation as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Rigid insulation within above-grade exterior wall construction.
 - 2. Miscellaneous blanket insulation.
 - 3. Attachment devices.

1.3 RELATED SECTIONS

- A. Roof insulation - Section 075200.
- B. Curtain wall insulation - Section 084126.
- C. Acoustic insulation - Section 092900.

1.4 SUBMITTALS

- A. Submit product data for each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type and brand. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation and replace with acceptable materials.
- C. Take every precaution to prevent the insulation from becoming wet, cover with tarps or other weather/watertight sheet goods.

1.6 ENVIRONMENTAL CRITERIA

- A. Recycled Content: Fiberglass insulation shall contain a minimum of 20% combined post-industrial/post-consumer recycled content.
- B. Emissions
 - 1. Where feasible, provide fiberglass insulation that does not contain formaldehyde binders.
 - 2. Fiberglass insulation in exposed locations and in ceiling plenums (used for HVAC return) shall be encapsulated with a continuous wrap of polyethylene or similar material.

PART 2 PRODUCTS

2.1 RIGID INSULATION WITHIN EXTERIOR WALL CONSTRUCTION

- A. Provide extruded polystyrene board insulation equal to Styrofoam "Cavitymate Ultra" manufactured by Dow Chemical Co. or approved equal conforming to ASTM C 578, Type IV with a maximum flame spread and smoke developed indices of 15 and 165 respectively.
 - 1. Boards shall be 16" wide x 96" long; boards shall be 1" thick unless otherwise noted on the drawings.
 - 2. Insulation shall have an aged R value of not less than 5.6/inch.

2.2 BLANKET INSULATION

- A. Provide flexible glass fiber blankets/batts equal to "Fiberglass Flame Spread 25 Insulation" as manufactured by Owens Corning or equal made by Manville or Certainteed conforming to ASTM C 612, Type 1A or ASTM C 665, Type III, Class A, faced on one side with foil reinforced Kraft vapor retarder; maximum flame spread and smoke developed indices 25 and 50 respectively.
- B. Insulation shall have an R value of not less than 3.7/inch and shall be 3" thick unless otherwise noted on the drawings.

2.3 ACCESSORIES

- A. Clips for Securing Insulation to Encountered Surfaces: Spindle anchor and washer type consisting of perforated metal plates with spindle welded to center and snap on washers. Spindle and washers shall receive a corrosion-resistant electro-zinc plating. Adhesives for securing clips in place shall be recommended by the approved clip manufacturer.
 - 1. Acceptable Manufacturers
 - a. Miracle Adhesives Corp.
 - b. Stic-Klip Mfg. Co., Inc.
 - c. Midwest Fasteners

- B. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer, and complying with fire-resistance requirements.
 - 1. For bonding rigid polystyrene insulation to masonry or concrete, provide adhesive equal to "Foamgrab PS" made by Dacor Products Co. or equal made by ChemRex Inc. or Miracle Adhesives.
- C. Protection Board: Premolded, semi-rigid asphalt/fiber composition board, 1/4" thick, formed under heat and pressure, standard sizes.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where building insulation is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

A. General

- 1. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.
- 2. Install insulation in as large components as practical and to cover entire areas indicated on the drawings, closely butted together at sides and ends, and against walls, beams, etc. Neatly fit and cut insulation around all projections such as pipes, conduits, hangers and all other elements encountered in the field, which will result in complete coverage of the scheduled areas.
- 3. Discard, off the site, insulation which becomes damaged during the course of installation, or is no longer in a physical condition to function for use intended, and replace with new material.
- 4. Clean surfaces on which adhesives are used to secure the insulation in place of dirt, grime, grease, oil and other foreign materials, to assure that the surfaces are properly prepared to accept the bond of the approved adhesives.
- 5. Align joints accurately, with adjoining surfaces set flush.
- 6. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces. All joints in vapor barriers shall be sealed with 4" wide, foil faced duct tape to prevent vapor and air migration.
- 7. Tape joints and ruptures in vapor barriers, using tape specified above, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of the units.

8. Where insulation is impaled on stick clips, provide clips not less than 3" from corners or edges and not more than 12" o.c.
9. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
10. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
11. Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.

3.3 INSTALLATION OF ABOVE-GRADE RIGID INSULATION

- A. Install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face, as recommended by manufacturer. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction.

3.4 INSTALLATION OF BLANKET OR BATT FIBERGLASS INSULATION

- A. Install blanket fiberglass insulation in largest pieces as practical with edges closely butted. Cut and fit insulation to closely fit intersecting or penetrating surfaces.
 1. Face vapor barrier towards warm side, tape joints with 4" wide vaporproof aluminum tape applied over vapor barrier.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

**SECTION 072616
BELOW GRADE VAPOR RETARDERS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Work Included:
 - 1. Gas vapor barrier to provide protection from formaldehyde vapors.
 - 2. Gas vapor barrier under buildings.
- B. Related Work:
 - 1. Excavation and backfilling.
 - 2. Gas abatement system, including piping and fittings. Coarse aggregate.

1.2 QUALITY ASSURANCE

- A. Gas vapor barrier: Applicator shall be trained and approved by the gas vapor barrier manufacturer.
- B. Prior to application of the gas vapor barrier, the Contractor shall hold a pre-installation conference with the Applicator and the Resident Engineer to ensure the proper substrate and installation conditions are provided.

1.3 SUBMITTALS

- A. Project Data: Manufacturer=s product data and installation instructions for:
 - 1. Gas vapor barrier material.
 - 2. Geotextiles.

1.4 DELIVERY, STORAGE AND HANDLING

Deliver materials to site in original unbroken packages bearing manufacturer=s label showing brand, weight, volume and batch number. Store materials at site in compliance with manufacturer=s instructions. Do not allow materials to freeze in containers.

1.5 JOB CONDITIONS

- A. Protect adjacent areas that are not to receive the gas vapor barrier. Wherever the membrane abuts other finish surfaces, apply masking to prevent staining of those surfaces that are to remain exposed. Provide additional product-manufacturer-approved covering if masking is insufficient to prevent staining.
- B. Perform work only when existing and future forecast weather conditions lie within the product manufacturer=s recommendations.
- C. Minimum clearance of 24 inches shall be provided for application of the product. For areas with less than 24-inch clearance, the product shall be applied by hand, but only if recommended by the manufacturer.
- D. Ambient temperature shall be within manufacturer=s requirements of greater than 32EF.
- E. Plumbing, electrical, mechanical and structural items to be located under or passing through the gas vapor barrier shall be positively secured in their proper positions and appropriately protected prior to membrane application.
- F. Gas vapor barrier shall be installed before placement of reinforcing steel. When this installation sequence is not possible, the exposed reinforcing steel shall be masked prior to membrane application.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gas Vapor Barrier System: Single-course, high-build, polymer-modified asphaltic emulsion, water-borne and spray applied at ambient temperatures. A minimum thickness of 80 dry mils, unless otherwise specified. Non-toxic and odorless trowel-grade material shall have similar properties with greater viscosity and shall be trowel applied. Vapor barrier shall be as manufactured by LBI Technologies, Inc., Anaheim, CA, or approved equal.

- 1. Protection: On vertical surfaces, provide MIRADRI 200V, or approved equal.

On horizontal surfaces provide MIRADRI 300HV; c inch thick asphaltic impregnated, felt and fiberglass protective mat, or approved equal.

2. Geotextile: Type 3401 non-woven geotextile, unless otherwise specified. At least one side shall be heat-rolled, and shall be used as the application surface.

B. Gas Vapor Barrier Physical Properties:

ELONGATION: ASTM D412 - 1,332% w/o reinforcement, 90% Recovery

ULTIMATE TENSILE STRENGTH: ASTM D412 - 58 p.s.i. w/o reinforcement

WATER PENETRATION RATE: ASTM D2434 - $<7.75 \times 10^{-9}$ cm/sec

WATER VAPOR PERMEABILITY: ASTM E96 - 0.24 U.S. Perms.

WATER VAPOR TRANSMISSION: ASTM E96 - 0.10 grains/h-sq ft

COLD BEND TEST: ASTM D146 - Passed, no cracking @ -25EF

ACCELERATED WEATHERING, 500 HOURS: ASTM D822 - No adverse effect

METHANE GAS PERMEABILITY: ASTM D1434 - None detected

PART 3 - EXECUTION

3.1 INSPECTION OF SURFACES AND CORRECTIVE WORK

Surfaces to receive the gas vapor barrier shall be inspected by the Contractor and the Applicator at least one day prior to commencing installation. Corrective work shall be performed as necessary to make the work of this Section perfect in all respects.

3.2 PREPARATION

- A. Provide 24-inch minimum clearance around perimeter of surfaces to receive gas vapor barrier. Prepare surfaces in accordance with manufacturer=s specifications, summarized as follows:
 1. Concrete: Surfaces shall be light broom finish or smoother, free of dirt, debris, loose material, release agents or curing compounds. Fill voids more than 3-inch deep and 3-inch wide. Provide a 1-inch minimum cant

of trowel grade or other suitable material, at horizontal-to-vertical transitions and other inside corners of 90° or less.

2. Subgrade: The subgrade, or aggregate layer, shall be rolled to provide a uniform, smooth surface. The finished surface shall be free of debris and standing water. Form stakes that penetrate the membrane shall be of manufacturer-recommended reinforcing steel bent over and left in the slab.
 3. Penetrations shall be prepared in accordance with manufacturer's specifications.
- B. Trenches shall be cut oversize to accommodate gas vapor barrier membrane and protection course with perpendicular to sloped sides and maximum obtainable compaction. Adjoining grade shall be finish graded and compacted. Excavated walls shall be free of roots and other deleterious matter.

3.3 INSTALLATION ON SOIL OR GRAVEL SURFACES

- A. Roll out geotextile on subgrade with the heat-rolled side facing up. Overlap seams at least 6 inches. Lay geotextile tight at inside corners. Spray membrane within the seam overlap to a thickness of 80 mils minimum.
1. Line trenches with geotextile extending at least 6 inches onto adjoining sub-grade if slab and footings are to be sprayed separately. Then proceed as specified above.
- B. Refer to Paragraph 3.5, A Sealing Around Penetrations, for procedures required in the sealing of penetrations.
- C. Spray apply gas vapor barrier onto geotextile to an 80-mil nominal dry thickness.
- D. Keep membrane free of dirt, debris and traffic until a protective cover is properly in place, as determined by the Resident Engineer.
- E. Do not penetrate membrane. Ensure that chairs and supports for concrete reinforcement placed on membrane have plastic tips to preclude damage to membrane.
- F. Lay down and butt-join the 6-oz/yd geotextile on the horizontal gas vapor barrier after surface moisture has evaporated from the membrane. On vertical surfaces apply 6-oz/yd geotextile. Attach to membrane with tape or mastic only.

3.4 INSTALLATION ON CONCRETE

- A. Because of the numerous variables affecting concrete, such as water content, mix design, cement source, Afree-lime@ percentage, calcium content, pumped vs. cast-in-place, environmental conditions at the time of concrete placement, admixtures, acidity, type of finish, curing conditions, and other factors, the gas vapor barrier shall be pretested to determine its reaction to the concrete, if any. Follow the procedures specified below.
- B. Refer to Paragraph 3.5, ASealing Around Penetrations,@ for procedures required in the sealing of penetrations.
- C. Provide a 1-inch minimum cant of trowel grade or other suitable material, at horizontal-to-vertical transitions and other inside corners of 90E or less. Allow to cure a minimum of 24 hours before application of vapor barrier.
- D. Delineate a test area on site with minimum dimensions of 10 feet by 10 feet. Apply gas vapor barrier to a thickness of 80 mils, and allow it to cure for 24 hours.
 - 1. Inspect for blisters. If no blistering occurs, proceed to the next step. If blistering does occur, apply a 10-mil tack coat of membrane AA@ side without catalyst to the concrete surface and allow to cure before proceeding. Follow also the requirements regarding blister repair in Paragraph 3.6.
- E. Spray the vapor barrier to an 80-mil nominal dry thickness.
- F. Keep membrane free of dirt, debris and traffic until protective cover is in place.
- G. Do not penetrate membrane.
- H. Lay down and butt-join the 6 oz/yd geotextile on the horizontal gas vapor barrier after surface moisture has evaporated from the membrane. On vertical surfaces apply 6 oz/yd geotextile. Attach to membrane with tape or mastic only.
- I. Non-Horizontal Surfaces: Spray shall begin at the bottom and proceed towards the top so as to allow the product to adhere to the surface before hitting catalyst runoff.

If blistering occurs, cut out blister; hand apply gas vapor barrier over the cutout area, and extend the barrier 3 inches beyond the cut to a minimum thickness of 80 dry mils.

3.5 SEALING AROUND PENETRATIONS

- A. Clean and etch the penetrations. Etch metal penetrations with a 10% muriatic acid solution.
- B. Roll out geotextile on subgrade, overlapping seams at least 6 inches. Cut the geotextile around penetrations so that geotextile lays flat on the subgrade. Lay geotextile tight at inside corners. Spray membrane within the seam overlap to a thickness of 80 mils minimum.
- C. Apply 80-mil nominal dry thickness, trowel-grade gas vapor barrier in a 3-inch-wide ring around the penetration and up the penetration a minimum of 3 inches.
- D. Allow the trowel-grade gas vapor barrier to cure completely before proceeding with remaining operations.
- E. Spray apply gas vapor barrier to 80-mil nominal dry thickness, around the penetration, completely encapsulating the collar assembly and to a height 12 inches minimum above the trowel-grade collar. Then spray apply gas vapor barrier to surrounding areas.
- F. Allow gas vapor barrier to cure completely before proceeding with remaining operations.
- G. Wrap penetration with polypropylene cable tie at a point 2 inches above the base of the penetration. Tighten the cable tie firmly so as to squeeze the cured membrane collar.

3.6 FIELD QUALITY CONTROL

- A. On Soil
 - 1. Samples to be inspected shall be cut from the membrane and geotextile sandwich to a maximum area of 2 square inches per 500 square feet. Measure the thickness with a mil-reading caliper.
 - 2. Voids left by sampling shall be patched with geotextile, overlapping the void by at least 2 inches. Apply a thin tack coat under the geotextile patch.

Spray- or trowel-apply gas vapor barrier to an 80 mil minimum dry thickness, extending at least 3 inches beyond geotextile patch.

B. On Concrete

1. Membrane shall be checked for coverage with a lightly oiled, needle nose depth gauge, taking 4 readings over a 1-square-inch area, every 500 square feet. Record the minimum reading. Mark the test area.
2. Test areas shall be patched with gas vapor barrier to an 80 mil minimum dry thickness, extending a minimum of 1 inch beyond the test perimeter.
3. A small number of blister heads, as determined by the Resident Engineer, shall be sampled and checked for proper membrane thickness. If the samples have the required membrane thickness of 80 mils nominal, then the remaining blisters will not be punctured or cut. If the samples have less than the minimum 80 mils, then the area shall either be resprayed to obtain the proper thickness, or the blisters shall be cut out and the area resprayed or patched with trowel-grade gas vapor barrier.

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SECTION 074243

ALUMINUM COMPOSITE WALL PANELS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the aluminum composite panels as shown on the drawings and specified herein, including but is not necessarily limited to the following:
 - 1. Prefinished, preformed composite wall panels.
 - 2. Aluminum composite wall panels used as safety rails.
 - 3. Sub-girts, trim and accessories required for complete installation.
 - 4. Sealant in conjunction with metal panel work.

1.3 RELATED SECTIONS

- A. Cold-formed metal framing - Section 054000.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

1.5 PERFORMANCE CRITERIA

- A. Structural Design: Design calculations, certified by a registered professional engineer, licensed in the State of New York, shall be submitted to verify load carrying capability of panel system. Panel system shall be capable of resisting a minimum positive and negative wind load of 30 psf without exceeding a deflection of $L/175$, unless greater required by Code.
 - 1. Panel systems used as safety rails shall comply with code requirements for guard rails and railings.
- B. Water Penetration: No evidence of water penetration under static pressure when tested in accordance with ASTM E 331 at a differential of 10% of inward acting design load, 6.24 psf minimum after 15 minutes.

- C. Air Infiltration: At 1.57 psf, air infiltration through the wall shall not exceed 0.06 cubic feet per minute when tested in accordance with ASTM E 283 at a test pressure of 20 psf.

1.6 SUBMITTALS

- A. Manufacturer's Data: Submit standard detail drawings and installation instructions for metal panels. Include manufacturer's certification or other data substantiating that the materials and finishes comply with the requirements. Indicate by copy of transmittal that the Installer has received a copy of the installation instructions.
- B. Samples: Submit 12" long by full width samples of each type of metal panels, complete with factory applied finish. Samples will be reviewed by Architect for pattern, texture and color only. Compliance with other requirements is the exclusive responsibility of the Contractor.
- C. Shop Drawings: Submit shop drawings showing the profiles of preformed metal panel units, and the details of forming, jointing (gaskets, if any), internal supports, anchorages, trim, flashing, and accessories. Show details of weatherproofing at edges, terminations, and penetrations of the metal panel work. Show small scale layout and elevations of entire work.
- D. Engineering Data: Submit engineering and test data and tables showing performance characteristics of the panels for loads, deflections and infiltration of air and water meeting standards specified herein.

1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.8 WARRANTY

- A. Exterior panel finish shall be warranted for a period of 10 years against failures of any kind.
- B. Composite wall panel system shall be warranted for a period of 5 years against failures of any kind.

1.9 COORDINATION

- A. Contractor must carefully coordinate his work with work of other trades that are penetrating through, or connecting to the metal siding. Openings required in siding to accommodate penetrations must be neatly and accurately made in the shop prior to job site delivery.
- B. Provide concealed reinforcing plates, anchors and supports to receive items mounted on panels as required to prevent deflection of panels.

- C. Provide all necessary trim, flashing, sealant as specified herein to insure watertight integrity of panels where penetrations occur.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide aluminum faced composite panels equal to "Alucobond" manufactured by Alcan Composites, U.S.A., or equal by Alcoa, Mitsubishi, Kasei or approved equal.
 - 1. System Type: "Rout and Return Wet," providing a wet seal (caulked) reveal joint. All joints shall be 1/2" max. unless otherwise noted.
 - 2. Panel Thickness: 6mm.

2.2 MATERIALS AND COMPONENTS

- A. Core: Thermoplastic material which in composite assembly meets performance characteristics specified and code requirements as set forth in the BOCA Basic/National Building Code for Class A construction.
- B. Face Sheets: 0.020" aluminum 3003 alloy, coated with specified high performance finish and bonded in a continuous process to core material to meet performance requirements.
- C. Bond Integrity: When testing in accordance with ASTM D 1781 for bond integrity, simulating resistance to delamination:
 - 1. Bond Strength: 220 psi minimum.
 - 2. Peel Strength: 22.5" lbs./in. minimum.
 - 3. Shall have successfully passed 6 each ASTM D 1037 weather cycling test.
 - 4. Shall have had no change in bond performance after 8 hours of submersion in boiling water.

2.3 COMPOSITE WALL PANEL FABRICATION

- A. Panels shall have a removable plastic film applied prior to fabrication and to remain on during fabrication, shipping, and erection. It will be removed just before caulking.
- B. Composition: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials. Panels shall be factory formed and complete with all related extrusions, fasteners, gasketing, etc., as required or a complete installation. Shop fabricated panels to sizes and joint configurations indicated on the drawings.
- C. Aluminum Face Sheets
 - 1. Thickness: 0.019 inch.
 - 2. Alloy: AA3000 Series.

- 3. Exterior Finish: Clear anodized.
- D. Panel Weight: 0.157 inch; 1.12 lbs./sq. ft.
- E. Tolerances
 - 1. Panel Bow: Maximum 0.8% of panel dimension in width and length.
 - 2. Panels Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
 - 3. Panel lines, breaks, and angles shall be sharp, true and surfaces free from warp or buckle.
 - 4. Maximum deviation from panel flatness shall be 1/8-inch in 5 feet on any panel in any direction for assembled units.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where metal panels are to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. General: Comply with panel manufacturer's instructions for assembly, installation and erection of metal panels.
- B. Metal Separation: Apply a coat of bituminous paint, concealed, on one or both surfaces wherever dissimilar metals would otherwise be in contact. Use gasket fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
- C. Anchor components parts of the metal panels securely in place, providing for necessary thermal and structural movement.
- D. Tolerances: Erect the panels horizontally, plumb, level and true to line with tolerances not exceeding 1/8" in runs of 20'-0", and within 1/16" of adjoining faces and of alignment of matching profiles.
- E. Fasteners: Provide an concealed fastener system, fastener finish to match panels.
- F. Joint Sealers: Install gaskets, joint fillers and sealants where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers recommended by panel manufacturer.
- G. Damaged Material: Remove and replace panels and component parts of the work which have been damaged (including finish) beyond successful repair, as directed by the Architect. Repair minor damage.

3.3 CLEANING AND PROTECTION

- A. Clean exposed surfaces of metal panels work promptly after completion of installation. Comply with recommendations of both the panel and coating manufacturer.
- B. Protection: The Installer of composite panels shall advise the Contractor in writing of protection and surveillance procedures which can be foreseen as needed to ensure that the work will be without damage or deterioration at the time of final acceptance after completion of other construction work.

END OF SECTION

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SECTION 075419

POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the thermoplastic membrane roofing and roof insulation as shown on the drawings and specified herein, including, but not limited to, the following:
 - 1. PVC sheet membrane roofing, fully adhered over roof insulation.
 - 2. Associated flashing.
 - 3. Accessories.

1.3 RELATED SECTIONS

- A. Sheet metal work - Section 076200.
- B. Roof drains - Division 22.

1.4 QUALITY ASSURANCES

- A. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. In addition, for roofing work, the contractor or subcontractor must be licensed or approved by the manufacturer of the roofing system.
- B. UL Listing: Provide labeled materials which have been tested and listed by UL for application indicated and which have a Class "A" rating.
- C. Roofing system shall have Energy Star rating.
- D. Comply with ASCE-7 and FM uplift of I-60.

1.5 SUBMITTALS

- A. Submit complete shop drawings showing details, dimensions, colors, fabrication and fastening elements for each condition encountered, layout of flat and tapered insulation, showing all seams, layout of each sheet noting seam locations, perimeter and

penetration flashing and other details where roofing abuts other materials and/or conditions, prior to roofing conference.

- B. Submit notarized letter indicating that roofing Subcontractor is an approved applicator of the manufacturer.
- C. Submit a letter signed by the manufacturer and Contractor acknowledging that the submitted roofing system complies with ASCE-7 and FM 1-90, for wind speed code requirements based on height and geographic location of project.

1.6 PREROOFING CONFERENCE

- A. Prior to ordering of materials, a preroofing conference will be held to discuss the specified roofing system, and its proper application. Conference shall include installer, roofing manufacturer, installers of related work, Architect and representatives of Owner. Record discussions and agreements and furnish copy to each participant. Provide at least 72 hours advance notice to participants prior to convening conference.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type, and brand. Delivered materials shall match approved samples. Fire classification labels shall be intact and visible.
- B. Store materials under cover in a dry and clean location, off the ground, and remove materials which are damaged, torn, or otherwise not suitable for installation, and replace with acceptable materials.
- C. Keep insulation and membrane dry, before and during installation. Remove wet materials from project site.
- D. Store roofing materials on platforms or pallets, above ground on roof level, and cover with tarpaulins or other suitable watertight covering. Store and handle in such a way as to prevent damage to edges or ends.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Work shall not be installed when the roof deck is damp, wet or spotted with frost or if the ambient temperature is 40 deg. F. and falling or if there is a forecast for inclement weather which will adversely affect the proper installation of the roofing system.
- B. Coordinate application of the roofing system in such a manner that the complete installation is weather-tight and in accordance with guarantee requirements.

1.9 WARRANTY

- A. Provide 20-year full system NDL warranty for the roofing work as specified in this Section commencing from date of substantial completion. Warranty shall protect the Owner against the costs of repairing leakage resulting from building defects in all components of the system supplied, including membrane, fasteners, and insulation, as well as from defects in the workmanship involved in their installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide PVC sheet roofing and flashing system as manufactured by one of the following, or approved equal:
 - 1. Sarnafil Décor Batten Feltback Adhered System (basis for project design).
 - 2. Flex.
 - 3. GAF.

2.2 ROOF MEMBRANE

- A. Provide 60 mil PVC non-woven fiberglass reinforced fabric-backed roof membrane with a lacquer coating, No. G410 Feltback, as manufactured by Sarnafil; membrane shall conform to ASTM D 4434, Type II, Grade 1.
 - 1. Membrane Color: G410 Light Gray #6500.

2.3 ACCESSORIES

- A. Flashing Membrane: Same as roof membrane or Sarnaclad (see E, below) as detailed or as required by surrounding conditions.
- B. Sarnacol 2121 Adhesive: Membrane and flashing adhesive for bonding the Sarnafil G 410 membrane to acceptable substrates.
 - 1. Application rate as recommended by the manufacturer.
- C. Sarnafil G459: Fiberglass reinforced PVC membrane 0.060" thick for joining Sarnafil to asphalt surfaces.
- D. Sarnaclad: PVC-coated, 0.020" thick membrane laminated to 25 gauge galvanized sheet metal.
- E. Sarnafash: Prefabricated expansion joint cover with nailing flanges and welding flaps.
- F. Sarnafelt: Non-asphaltic polyester felt used as an asphalt barrier and leveling layer.
- G. Sarnamatic Welder: Automatic hot-air welding apparatus for seaming of sheets.
- H. Prefabricated Details: Inside/outside corners or vent stacks (2", 3", 4", and 5" diameters).
- I. Sarnastop: 16 gauge flat galvanized bar pre-punched every 12" on center used for additional uplift resistance at the base of parapets, walls, curbs, peaks, valleys, and transitions.
- J. Sarnafastener: Corrosion resistant anchors for concrete decks. Include corrosion resistant plates for securement of insulation.
- K. Sarnasolv: A solvent cleaner for removal of Sarnacol adhesives from lap areas and for removal of contaminants from the Sarnafil membrane.

- L. Sarnabar: 14 gauge galvanized steel bar, channel shaped, punched 1" on center, for use as a 4-foot perimeter bar where specified or required.

2.4 RELATED MATERIALS

A. Vapor Retarders

1. Vapor retarders for use in a fully adhered system shall meet Building Code Requirements.
2. Vapor retarders shall be approved in writing by the vapor retarder manufacturer for intended use.
3. Vapor retarders shall be compatible with insulation and other accessories.
4. Vapor retarders shall be accepted by Sarnafil.

B. Vapor Retarder Fastener

1. Vapor retarder/base sheet fasteners shall meet Building Code.
2. Fasteners shall be approved by the vapor retarder manufacturer.
3. Fasteners shall provide adequate uplift resistance.
4. Fasteners shall be accepted by Sarnafil.

- C. Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, 1/2" thick, equal to "Dens Deck" by Georgia-Pacific Corporation.

D. Insulation

1. Insulation shall be installed in multiple layers to obtain required thermal value.
 - a. Insulation shall meet all identified code requirements.
 - b. Insulations shall be approved in writing by the insulation manufacturer for intended use, and for use with Sarnafil materials.
 - c. Insulation shall be compatible with Sarnafil membrane.
 - d. Insulation shall be accepted by Sarnafil.
 - e. Product: Sarnatherm isocyanurate insulation with fiberglass facers supplied by Sarnafil Inc.
2. Insulation shall be tapered (1/4"/ft. unless otherwise indicated) and flat rigid board type designed for roof application.
 - a. Provide tapered insulation crickets at 1/4" per foot where indicated on drawings.
3. Roof insulation shall be of sufficient thickness to achieve a minimum "R" value of 19 at 75 deg. F.
4. Insulation Manufacturer's Warranty: The insulation manufacturer shall submit, in writing to the building Owner, and Sarnafil shall receive a copy of, its recommendations for the use of the product, including:

- a. Name of specific project.
 - b. Statements that express the warranty conditions for the successful performance of their insulation for the duration of the Sarnafil warranty.
 - c. Fastener recommendations, including attachment rate.
- E. Insulation Attachment: Provide corrosion-resistant fasteners for penetration into wood and plywood substrates as recommended by the insulation manufacturer.
1. Fastener and plates shall be approved in writing by the fastener manufacturer for intended use, and for use with Sarnafil products.
 2. Fastener and plates shall be accepted by Sarnafil.

2.5 MISCELLANEOUS FASTENERS AND ACCESSORIES

- A. Miscellaneous Fasteners and Anchors: In general all fasteners, anchors, nails, and straps, shall be of zinc or cadmium plated steel, galvanized, or stainless steel. All fasteners and anchors shall have a minimum embedment of 1-1/2" and shall be approved for such use by the fastener manufacturer. All fasteners shall meet Factory Mutual Standard 4470 for corrosion resistance.

PART 3 EXECUTION

3.1 GENERAL

- A. Coordinate the installation so that each area is made watertight at the end of each work period.
- B. The plywood substrate shall be smooth, level, and free from moisture or frost. Sharp ridges or other projections above the surface shall be removed before application of roofing and flashing.

3.2 INSTALLATION OF VAPOR BARRIER

- A. Install vapor retarder over substrate board with all sides and ends lapped, and penetrations sealed in accordance with manufactured recommendations. Adhere base sheet in full moping of type III hot asphalt. Install second ply in same manner and seal with an asphalt glaze coat.

3.3 INSTALLATION OF SUBSTRATE MEMBERS

- A. Wood Nailers
1. Install continuous treated wood nailers conforming to the requirements of Section 062000 at the perimeter of the entire roof and around roof projections and penetrations as shown on drawings.
 2. Nailers shall be anchored to resist minimum force of 175 pounds per lineal foot in any direction. Fastener spacing shall be a maximum of 3 feet on center. Fasteners shall be installed within 6 inches of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.
 3. Thickness shall be as required to match insulation height.

3.4 INSULATION INSTALLATION

- A. Insulation shall be mechanically attached to the substrate using accepted fasteners and insulation plates. Fastening rate and pattern shall conform to insulation manufacturer and Sarnafil recommendations.
- B. Fasteners are to be installed in accordance with the fastener manufacturer's recommendations. Fasteners are to have minimum penetration into the substrate recommended by the fastener manufacturer and Sarnafil.
- C. Use fastener tools with a depth locator as recommended or supplied by the fastener manufacturer to ensure proper installation.

3.5 INSTALLATION OF MEMBRANE

- A. The surface of the insulation shall be inspected prior to installation of the roof membrane. The substrate shall be clean, dry, and smooth with no excessive surface roughness, contaminated surfaces, or unsound surfaces such as broken or delaminated insulation boards.
- B. Over the properly installed and prepared substrate surface, adhesive shall be applied using approved solvent resistant 3/4" nap paint rollers. The adhesive shall be applied at a rate of approximately 3/4 to 1-3/4 gallons per 100 sq. ft. to the substrate depending upon substrate and finish. The adhesive shall be applied in a smooth, even coating with no holidays, globs, puddles, or similar irregularities. Only an area that can be covered completely in the same days operations shall be coated with adhesive. The adhesive shall be allowed to dry completely prior to installing the membrane.
- C. When the adhesive on the substrate is dry, the Sarnafil roof membrane is unrolled into a second layer of wet adhesive. Adjacent sheets shall be overlapped a minimum of 3". Once in place, one-half of the sheets length shall be turned back and the underside shall be coated with adhesive at a rate of 1/2 gallon per 100 sq. ft. while adhesive is active. The coated membrane shall be rolled carefully onto the previously coated substrate to avoid wrinkles. Do not allow adhesive on the underside of the Sarnafil membrane to dry completely. The amount of membrane that can be coated with adhesive before rolling into substrate will be determined by ambient temperature, humidity, and manpower. The bonded sheet shall be pressed firmly into place with a weighted foam covered lawn roller. The remaining unbonded half of the sheet shall be folded back and the bonding procedure repeated.
- D. No bonding adhesive shall be applied in lap areas. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.

3.6 HOT-AIR WELDING OF LAP AREAS

A. General

1. Adjacent sheets shall be welded in accordance with Sarnafil's written instructions. All side and end lap joints shall be hot-air welded. Lap area shall be a minimum of 3 inches wide when machine welding, and a minimum of 4 inches wide when hand welding.
2. Welding equipment shall be provided by or approved by Sarnafil. All mechanics intending to use the equipment shall have successfully completed a course of instruction provided by a Sarnafil representative prior to welding.
3. All surfaces to be welded shall be clean according to Sarnafil's instructions, and dry. No adhesive shall be present within the lap areas.

3.7 MEMBRANE FLASHINGS

- A. All flashing shall be installed concurrently with the roof membrane as the job progresses. If any water is allowed to enter under the new roofing due to incomplete flashings, the affected areas shall be completely removed and replaced at the Contractor's expense. Flashings shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces.

1. Contact Adhesive for Flashings

- a. Over the properly installed and prepared substrate surface, adhesive shall be applied at a rate of approximately 3/4 to 2 gallons per 100 square feet of surface depending upon substrate. The adhesive shall be applied in smooth, even coatings with no holidays, globs, puddles, or similar irregularities. Only an area that can be covered completely in the same day's operations shall be coated with adhesive. The surface with adhesive coating shall be allowed to dry completely prior to installing the membrane.
 - b. When the surface is dry, the flashing membrane shall be cut to a workable length and the underside shall be coated evenly with adhesive at a rate of 1/2 gallon per 100 square feet. When the adhesive has dried sufficiently to produce strings when touched with a dry finger, the coated membrane shall be rolled carefully onto the previously coated substrate to avoid wrinkles. Do not allow adhesive on the underside of the Sarnafil membrane to dry completely. The amount of membrane that can be coated with adhesive before applying to substrate will be determined by ambient temperature, humidity, and manpower. Adjacent sheets shall be overlapped a minimum of 4 inches. Flashings shall extend 5 inches onto the roofing membrane. The bonded sheet shall be pressed firmly into place with a hand roller.
 - c. No bonding adhesive shall be applied in lap areas that are to be welded to flashings or adjacent sheets. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.
2. Install Sarnastop, fastened 12" on center with acceptable fasteners into the structural deck at the base of parapets, walls, and curbs. Sarnastops shall also be installed at the base of fiberboard tapered edge strips and at transitions, peaks, and valleys according to Sarnafil's recommended details.

3. Sarnafil's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by Sarnafil prior to installation.
4. All flashing membranes shall be fully adhered to solvent-resistant substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bituminous elements shall be in contact with the Sarnafil membrane.
5. All flashing shall be hot-air welded at their joints and at their connections with the roof membrane.
6. Flashings shall be terminated according to Sarnafil recommended details.

3.8 ROOF DRAINS

- A. Install 1-1/2" x 18" Tapered Edge Strips to form a gradually tapered sump transition from top of insulation to roof drain flange. Minimum sump size to be 4 ft. by 4 ft.
- B. Install roofing plies, starting at the low point (roof drain) in a shingle fashion so that four plies are provided, trimming felt plies at edge of drain flange.
- C. Install a 4# lead flashing (minimum size 30" x 30"), set in bed of flashing cement, on top of roofing plies. Form lead to shape of sump and into drain bowl, trimming neatly approx. 1" beyond ring. Install clamping ring immediately.
- D. Prime top surface of lead with asphalt primer. Allow to dry completely.
- E. Strip in lead with one ply of SBS Modified Bitumen membrane, extending from clamping ring out a minimum of 6" beyond lead.

3.9 CLEANING AND PROTECTION

- A. From time to time during the progress of the work and at the completion of the work, remove all rubbish, debris, dirt, equipment and unused materials from the site. Clean adjoining surfaces which may have been soiled by roofing work.
- B. Protect installed roofing from damage and abuse by other trades. Repair damages to watertight conditions at no additional cost to the Owner.
- C. Exercise care to protect installed work. Work which does become damaged in any way or is not watertight, shall be repaired and/or replaced as directed to the satisfaction of Architect and/or Owner at no additional cost or time.

END OF SECTION

SECTION 076200

SHEET METAL WORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the sheet metal work, as indicated on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Stainless steel cap metal flashing.
 - 2. Stainless steel through wall flashing.
 - 3. Field fabricating (including bending, cutting, soldering, etc.), if required, of stainless steel flashing.
 - 4. Stainless steel flashing elsewhere, where metal flashing is indicated on drawings.
 - 5. Separation of contacting surfaces of dissimilar metals.

1.3 RELATED SECTIONS

- A. Unit masonry - Section 042000.
- B. Roofing - Section 075419.

1.4 SUBMITTALS

- A. Shop Drawings: Submit, showing all materials, finishes, fastenings, joint details, fabrication, construction and relation to adjoining construction.
- B. Samples: Submit 12" x 12" samples of flashing materials and finishes.

1.5 WARRANTY

- A. The Contractor shall warrant that all Metal Flashing Work executed under this Section will be free from defects in materials and workmanship for a period of ten (10) years from date of acceptance of the Project, and he shall remedy any defects in the Metal Flashing Work.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Stainless Steel Flashing Materials

- 1. Stainless Steel Flashing: ASTM A 167, Type 304, stainless steel, with 2D finish, dead soft temper, fully annealed, as manufactured by International Nickel Co., Republic Steel Corp., United States Steel, or Washington Steel Corp. Thickness of stainless steel shall be as listed below.
 - a. Concealed Flashings: Twenty-four (24) gauge (U.S. Standard).
 - b. Exposed Flashings: Eighteen (18) gauge (U.S. Standard).
 - c. Edge Strips: Eighteen (18) gauge (U.S. Standard).
 - 2. Through wall flashing shall have sawtooth ribs at three (3) inch interval as manufactured by Keystone Flashing Co., or approved equal.
 - 3. Accessories and Fastenings: AISI, Types 302 and 304 stainless steel.
 - 4. Solder: Composed of sixty (60) percent block tin and forty (40) percent pig lead, except that solder at seams exposed to public view shall be eighty (80) percent tin and twenty (20) percent lead.
 - 5. Flux: An acid type flux manufactured specifically for soldering stainless steel, as approved.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where sheet metal work is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 METAL FLASHING INSTALLATION

- A. Reference Standard: Conform to the requirements of 5th Edition of the Sheet Metal and Air Conditioning Contractors Association (SMACNA) Architectural Sheet Metal Manual.
- B. General: Fabricate and install metal flashing work in accordance with details and specifications of above Reference Standard, with manufacturer's instructions, and as herein specified, to provide a watertight installation. Apply metal flashing to smooth, even, sound, clean, dry surfaces free from defects. Make provisions to allow for expansion and contraction of metal flashing work. Wherever practicable, shop form all metal flashing work and deliver ready for installation. Form metal flashing work accurately to required profiles, with flat surfaces, straight edges and corners, free from defects. Fold exposed metal edges back not less than 1/2" and form drip.
- C. Nailing: Confine to sheets twelve (12) inches or less in width. Confine nailing to one edge only, locate nails where concealed. Use No. 12 x 1" long flat headed, annular threaded, Type 302 stainless steel nails for nailing to wood blocking; use one (1) inch long masonry nails for nailing to concrete. Space nails four (4) inches o.c. maximum.
- D. Cleating: Use cleats where sheets are more than twelve (12) inches in width. Space cleats approximately twelve (12) inches o.c. Cleats two (2) inches wide by three (3) inches long, of the same material and weight as the metal flashing being installed. Secure one end of the cleat with two (2) nails and fold edge back over the nail heads. Lock other end into seam or into folded edge of metal flashing sheets. Pre-tin cleats for soldered seams.
- E. Joining: Join metal flashings with one (1) inch locked and soldered seams except at slip joints. Mallet seams flat and solder full length of seam as specified below.
- F. Soldering: Clean and pre-tin edges of metal flashing to be soldered before soldering is begun with solder on both sides for a width of not less than 1-1/2". Solder slowly with well heated metal surfaces. Use ample solder. Show not less than one full inch of evenly flowed solder on seam. Seams shall have a liberal amount of flux brushed in before soldering is commenced. Where soldering paste or killed acid is employed as a flux, soldering shall follow immediately after application of the flux. Upon completion of soldering, clean surfaces of all flux.
- G. Slip Joints: Locate slip joints not more than twenty-four (24) feet apart and not more than eight (8) feet from corners. Form slip joints as three (3) inch wide joints with cover piece behind flashing, and fill locked ends neatly with sealant.
- H. Cap Flashing: Install over base flashings, in eight (8) to ten (10) foot lengths, lapped six (6) inches at ends. Cap flashing shall be increased longitudinally to produce spring action to hold bottom edge of cap flashing firmly against base flashing. Cap flashing shall lap base flashing at least four (4) inches, with exposed bottom edge at a forty-five (45) degree angle downward and folded back on underside at least 1/2" to form drip. Make cap flashing continuous at corners and angles.

- I. Miscellaneous Flashing: Provide all other miscellaneous metal flashing not specifically mentioned herein, but indicated on drawings and/or required to provide a watertight installation.
- J. Separation of Dissimilar Materials: Back paint surfaces of metal flashing in contact with dissimilar metals or with concrete or masonry with bituminous paint. Reglets
 - 1. Provide watertight reglets in masonry and concrete work to receive cap flashing. Form reglets of stainless steel using same thickness as stainless steel sheet metal specified.
 - 2. In masonry work use open or closed slot reglets with slot at least one (1) inch deep and 3/16" wide. Provide hook dams or turn-ups for anchoring securely into mortar joints. Insert cap flashing into slot full depth using button punch or lead wedges to lock in place.
 - 3. In concrete work, use open or closed slot reglets with slot sloped upward at forty-five (45) degrees, at least one (1) inch deep and 3/16" wide. For fastening reglets to concrete forms use double-head stainless steel nails spaced twelve (12) inches apart maximum.
 - 4. Insert cap flashing full depth into reglet slot, and wedge in place using lead strips spaced on twelve (12) inch centers maximum or lead caulking rope. When lead strips are used for continuous caulked reglets, use approved weather-resistant fibrous compounds.
- K. Through-the-Wall Flashings: Provide through-the-wall flashings as shown. Form bonding features so as not to puddle water on surface. Lap cross joints to interlock design pattern at least three (3) inches. Stop typical flashings in mortar joint 1/2" from exterior face of wall.

END OF SECTION

SECTION 077100

ROOF SPECIALTIES AND ACCESSORIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the roof specialties and accessories as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:

- 1. Roof hatches.

1.3 RELATED SECTIONS

- A. Roofing - Section 075419.
- B. Sheet metal flashing - Section 076200.

1.4 SUBMITTALS

- A. Before any roof specialties and accessories are delivered to the job site, submit shop drawings showing profiles and anchoring devices.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 ROOF HATCH

- A. Provide shop-primed, galvanized steel roof hatch units of sizes shown on drawings, with 1" rigid insulation at curbs, insulated double-wall lids, and standard self-lifting mechanism. Provide manufacturer's standard hardware, including hold-open device, hinges, latch and operating handles for inside operation. Construct units for 40 lbs. per sq. ft. live load.

- B. Safety Railing System: Aluminum composite wall panels. See Section 074243.
 - 1. Height: 5'-0" above finished roof deck.
 - 2. Test load per code requirements.
 - 3. Provide self-latching gate fabricated of same materials as safety railing system.
- C. Provide units manufactured by Bilco, Babcock-Davis, Milcor or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where roof specialties and accessories are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and with roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- B. Isolation: Where metal surfaces of units are to be installed in contact with non-compatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
- C. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.
- D. Operational Units: Test operational units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION

SECTION 078413

FIRESTOPS AND SMOKESEALS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the firestops and smoke seals as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Penetrations through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - 2. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - 3. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
 - 4. Sealant joints in fire-resistance-rated construction.
 - 5. Penetrations at each floor level in shafts and/or stairwells.
 - 6. Construction joints, including those between top of fire rated walls and underside of floors above; and those between exterior curtain walls and the outer perimeter edge of floor assemblies.

1.3 RELATED SECTIONS

- A. Cast-in-place concrete - Section 033000.
- B. Unit masonry - Section 042000.
- C. Joint sealers - Section 079200.
- D. Aluminum curtain wall - Section 084413.
- E. Drywall - Section 092900.
- F. Intumescent coatings - Section 099646.
- G. Ducts and piping penetrations - Division 22.

- H. Cable and conduit penetrations - Division 26.

1.4 REFERENCES

- A. ASTM E 814 "Standard Method of Fire Tests of Through-Penetration Firestops."
- B. UL 1479, UBC 7-5 (Both are same as A. above).
- C. ASTM E 119 "Standard Method of Fire Tests of Building Construction and Materials."
- D. UL 263, UBC 7-1 (Both are same as C. above).
- E. UL 2079 "Tests For Fire Resistance of Building Joint Systems."
- F. ASTM E 1399 "Test For Dynamic Movement Conditions."
- G. ASTM E 1966 (Same as E. above).
- H. Published Through-Penetration Systems by recognized independent testing agencies.
 - 1. UL Fire Resistance Directory, Volume II of current year.
 - 2. Warnock Hersey Certification Listings, current year.
 - 3. Omega Point Laboratories, current year.
- I. Material must have BSA and/or MEA approval for use in New York City.

1.5 SUBMITTALS

- A. Submit manufacturer's product literature for each type of firestop material to be installed. Literature shall indicate product characteristics, typical uses, performance, limitation criteria, test data and indication that products comply with specified requirements.
- B. Submit shop drawings detailing materials, installation methods, and relationships to adjoining construction for each firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspection agency evidencing compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.
- C. Material Safety Data Sheets: Submit MSDS for each firestop product.
- D. Submit qualifications of firestop installer, including letter from firestop manufacturer of products proposed to be installed, wherein manufacturer approves or recognizes as trained/ or certifies installer for installation of that manufacturer's products.

- E. Manufacturer's Letters: For installations or configurations not covered by a UL or Warnock Hersey design number, a recommendation shall be obtained from the manufacturer, in writing, for the specific application.

1.6 QUALITY ASSURANCE

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, and the passage of smoke and other gases.
- B. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings as required by local building code and as tested by nationally accepted test agencies per ASTM E 814 or UL 1479. The F rating must be a minimum of one (1) hour but not less than the fire resistance rating of the assembly being penetrated. T rating, when required by code authority, shall be based on measurement of the temperature rise on the penetrating item(s). The fire test shall be conducted with a minimum positive pressure differential of 0.01 inches of water column.
- C. Firestopping products shall be asbestos free and free of any PCBs.
- D. Do not use any product containing solvents or that requires hazardous waste disposal.
- E. Do not use firestop products which after curing, dissolve in water.
- F. Do not use firestop products that contain ceramic fibers.
- G. Firestopping Installer Qualifications: Firestop application shall be performed by a single firestopping contractor who specializes in the installation of firestop systems, whose personnel to be utilized have received specific training and certification or approval from the proposed respective firestop manufacturer, and firestop installer shall have a minimum of three years experience (under present company name) installing firestop systems of the type herein specified.
- H. Mock-Up: Prepare job site mock-ups of each typical Firestop System proposed for use in the project. Approved mock-ups will be left in place as part of the finished project and will constitute the quality standard for the remaining work.
- I. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original unopened containers with manufacturer's name, product identification, lot numbers, UL or Warnock Hersey labels, and mixing and installation instructions, as applicable.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturer.
- C. All firestop materials shall be installed prior to expiration of shelf life.

1.8 PROJECT CONDITIONS

- A. Verify existing conditions and substrates before starting work
- B. Do not use materials that contain solvents, show sign of damage or are beyond their shelf life.
- C. During installation, provide masking and drop cloths as needed to prevent firestopping products from contaminating any adjacent surfaces.
- D. Conform to ventilation requirements if required by manufacturer's installation instructions or Material Safety Data Sheet.
- E. Weather Conditions: Do not proceed with installation of firestop products when temperatures are in excess or below the manufacturer's recommendations.
- F. Schedule installation of firestop products after completion of penetrating item installation but prior to covering or concealing of openings.
- G. Coordinate this work as required with work of other trades.

1.9 SEQUENCING AND SCHEDULING

- A. Pre-Installation Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
- B. Sequence: Perform work of this and other sections in proper sequence to prevent damage to the firestop systems and to ensure that their installation will occur prior to enclosing or concealing work.
- C. Install all firestop systems after voids and joints are prepared sufficiently to accept the applicable firestop system.
- D. Do not cover firestop systems until they have been properly inspected and accepted by the authority having jurisdiction.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following manufacturers:
 - 1. Tremco
 - 2. Bio-Fireshield
 - 3. 3M
 - 4. Specified Technologies Inc.
 - 5. U.S. Gypsum Co.
 - 6. Nelson
 - 7. Hilti, Inc.
 - 8. Grace Flame Safe

2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:
 - 1. Permanent forming/damming/backing materials including the following:
 - a. Semirefractory fiber (mineral wool) insulation.
 - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Joint fillers for joint sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. Steel sleeves.
- C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

- D. Smoke seals at top of partitions shall be flexible to allow for partition deflection.

2.3 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

- A. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.
- B. Intumescent, Latex Sealant: Single-component, Intumescent, latex formulation.
- C. Intumescent Putty: Non-hardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.
- D. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum or polyethylene foil on one side.
- E. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
- F. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- G. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
- H. Silicone Foam: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, non-shrinking foam.
- I. Silicone Sealant: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless firestop system limits use to non-sag grade for both opening conditions.

2.4 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.
 - 1. Sealant Colors: Color of exposed joint sealants as selected by the Architect.
- B. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
 - 1. Additional Movement Capability: Provide sealant with the capability to withstand 33 percent movement in both extension and compression for a total of 66 percent movement.

- C. Multi-Component, Non-Sag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
 - 1. Additional Movement Capability: Provide sealant with the capability to withstand 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated.
 - D. Single-Component, Non-Sag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.
- 2.5 MINERAL FIBER/CERAMIC WOOL NON-COMBUSTIBLE INSULATION (FIRE SAFING)
- A. Provide min. 4 pcf Thermafiber as manufactured by Thermafiber Co., min. 4 pcf FBX Safing Insulation as manufactured by Fibrex, or approved equal to suit conditions and to comply with fire resistance and firestop manufacturer's requirements.
 - B. Material shall be classified non-combustible per ASTM E 119.
- 2.6 MIXING
- A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with Installer present, for compliance with requirements for opening configuration, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
 - 1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 - 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form release agents from concrete.

- B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

3.3 CONDITIONS REQUIRING FIRESTOPPING

A. Building Exterior Perimeters

1. Where exterior facing construction is continuous past a structural floor, and a space (i.e. construction joint) would otherwise remain open between the inner face of the wall construction and the outer perimeter edge of the structural floor, provide firestopping to equal the fire resistance of the floor assembly.
 - a. If mineral wool is part of firestop system, the mineral wool must be completely covered by appropriate thickness of UL or Warnock Hersey listed firestop sealant or spray.
 - b. Refer to Article 3.6 herein for description of fire safing insulation.
2. Firestopping shall be provided whether or not there are any clips, angles, plates, or other members bridging or interconnecting the facing and floor systems, and whether or not such items are continuous.
3. Where an exterior wall passes a perimeter structural member, such as a girder, beam, or spandrel, and the finish on the interior wall face does not continue up to close with the underside of the structural floor above, thus interrupting the fire-resistive integrity of the wall system, and a space would otherwise remain open between the interior face of the wall and the structural member, provide firestopping to continuously fill such open space.

B. Interior Walls and Partitions

1. Construction joints between top of fire rated walls and underside of floors above, shall be firestopped.
2. Firestop system installed shall have been tested by either UL or Omega Point, including exposure to hose stream test and including for use with steel fluted deck floor assemblies.
3. Firestop system used shall allow for deflection of floor above.

C. Penetrations

1. Penetrations include conduit, cable, wire, pipe, duct, or other elements which pass through one or both outer surfaces of a fire rated floor, wall, or partition.
2. Except for floors on grade, where a penetration occurs through a structural floor or roof and a space would otherwise remain open between the surfaces of the

penetration and the edge of the adjoining structural floor or roof, provide firestopping to fill such spaces in accordance with ASTM E 814.

3. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall of opening.
- D. Provide firestopping to fill miscellaneous voids and openings in fire rated construction in a manner essentially the same as specified herein before.

3.4 INSTALLING THROUGH PENETRATION FIRESTOPS

- A. General: Comply with the through penetrations firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through penetration firestop systems by proven techniques to produce the following results:
 1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.5 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install joint fillers to provide support of sealants during application and at position required to produce the cross sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire resistance rating required.
- C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.
- D. Tool no sag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to

produce fire resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.6 INSTALLING FIRESAFING INSULATION

- A. Install fire safing insulation utilizing welded or screw applied galvanized steel impaling pins and retaining clips; space clips or pins 24" o.c. maximum.
- B. Completely fill voids in areas where safing insulation is required. At spandrel conditions/floor edges, depth of insulation top to bottom shall be at least four (4) inches.
- C. Cover top of all safing insulation with firestop sealant or spray.

3.7 FIELD QUALITY CONTROL

- A. Inspecting agency employed and paid by the Owner will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.
- B. Inspecting agency will report observations promptly and in writing to Contractor, Owner and Architect.
- C. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.
- D. Where deficiencies are found, Contractor must repair or replace firestopping so that it complies with requirements.

3.8 CLEANING

- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.
- B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to product firestopping complying with specified requirements.

END OF SECTION

SECTION 079200

JOINT SEALERS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the joint sealers work as shown on the drawings and/or specified herein, including but not necessarily limited to the following:

1. Exterior wall joints not specified to be sealed in other Sections of work.
2. Interior wall joints not specified to be sealed in other Sections of work, including caulking to fill between architectural woodwork and any wall, floor and/or ceiling imperfections.
3. Control and expansion joints in walls.
4. Joints at wall penetrations.
5. Joints between items of equipment and other construction.
6. All other joints required to be sealed to provide a positive barrier against penetration of air and moisture.

1.3 RELATED SECTIONS

- A. Roofing - Division 7.
- B. Firestop sealants - Section 078413.
- C. Sealant at metal to metal components of curtain wall - Section 084413.
- D. Glazing sealants - Section 088000.
- E. Sealant within drywall construction - Section 092900.
- F. Sealant at tile work - Section 093000.
- G. Sealant at paving - Division 32.

1.4 QUALITY ASSURANCE

- A. Qualification of Installers: Use only personnel who are thoroughly familiar, skilled and specially trained in the techniques of sealant work, and who are completely familiar with the published recommendations of the sealant manufacturer.
- B. Pre-Construction Field Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to project joint substrates according to the method in ASTM C 794 and C 1521 that is appropriate for the types of Project joints.
- C. Perform testing per ASTM C 1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work shall start until results of these tests have been submitted to the Architect and he has given his written approval to proceed with the work.
- D. Environmentally-Preferable Product Criteria:
 - 1. VOC Content: The volatile organic compound (VOC) content of sealants and sealant primers used in interior applications shall not exceed the limits defined in Regulation 8 (Organic Compounds), Rule 51 (Adhesive and Sealant Products) of the Bay Area Air Quality Management District (BAAQMD), of the State of California. The VOC limits defined by BAAQMD (based on 5/2/01 amendments) are as follows. All VOC limits are defined in grams per liter, less exempt compounds.
 - a. Sealants:

Architectural	250
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 - b. Sealant Primers:

Architectural (Non-porous installation)	250
Architectural (Porous installation)	775
 - 2. Sealants, primers, and cleaners required for sealant installation must also comply with all local regulations controlling VOC content.

1.5 SUBMITTALS

- A. Shop Drawings: Submit shop drawings showing all joint conditions, indicating relation of adjacent materials, all sealant materials (sealant, bond breakers, backing, primers, etc.), and method of installation.
 - 1. Submit joint sizing calculations certifying that movement capability of sealant is not being exceeded.
- B. Samples: Submit the following:
 - 1. Color samples of sealants.
 - 2. Sealant bond breaker and joint backing.

- C. Product Data: Submit manufacturer's technical information and installation instructions for:
 - 1. Sealant materials, indicating that material meets standards specified herein.
 - 2. Backing rods.
- D. Submit manufacturer's certification as required by Article 1.6 herein.
- E. Submit results of testing required in Article 1.4 herein.

1.6 MANUFACTURER'S RESPONSIBILITY AND CERTIFICATION

- A. Contractor shall require sealant manufacturer to review the Project joint conditions and details for this Section of the work. Contractor shall submit to the Architect written certification from the sealant manufacturer that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vaportight seals (as applicable), and that materials supplied meet specified performance requirements.

1.7 ENVIRONMENTAL CONDITIONS

- A. Temperature: Install all work of this Section when air temperature is above forty (40) degrees F. and below eighty (80) degrees F., unless manufacturer submits written instructions permitting sealant use outside of this temperature range.
- B. Moisture: Do not apply work of this Section on surfaces which are wet, damp, or have frost.

1.8 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section, before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Storage
 - 1. Store sealant materials and equipment under conditions recommended by their manufacturer.
 - 2. Do not use materials stored for a period of time exceeding the maximum recommended shelf life of the material.

1.9 GUARANTEE

- A. Provide a written, notarized guarantee from the manufacturer and the applicator stating that the applied sealants shall remain watertight for a period of ten (10) years.

- B. Guarantee shall be in a form acceptable to the Owner and executed by an authorized individual.
- C. Guarantee shall further state that installed sealant is guaranteed against:
 - 1. Adhesive or cohesive failure of sealant joints.
 - 2. Cracking greater than three (3) mils in depth developing on surface of material.
 - 3. Staining of surfaces adjacent to joints by sealants or primer by migration through building materials in contact with them.
 - 4. Chalking, or visible color change on surface of cured sealant.
 - 5. Increase or decrease of "Shore A" durometer hardness (5 second reading) of sealant of more than thirty (30) percent of seven (7) day value of "Shore A" durometer hardness of sealant.
- D. Include in guarantee provision, agreement to repair and/or replace, at Contractor's expense, sealant defects which develop during guarantee period, because of faulty labor and/or materials.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

- A. Exterior Wall Sealant: Provide one (1) part non-sag sealant equal to No. 790 or 795 made by Dow Corning, "Silpruf SCS 2000" or "LM SCS 2700" made by G.E. or "Spectrem 1" or "Spectrem 3" made by Tremco or "Sonolastic 150" by Sonneborn conforming to the minimum standards of ASTM C 920, Type S, Grade NS, Class 50.
- B. Interior Sealant: Provide a one (1) part acrylic based sealant conforming to ASTM C 834, equal to "AC-20+ Silicone" made by Pecora or equal made by Tremco.
- C. Colors: Custom colors of sealants as selected by the Architect.

2.2 MISCELLANEOUS MATERIALS

- A. Back-Up Materials: Provide back-up materials and preformed joint fillers, non-staining, non-absorbent, compatible with sealant and primer, and of a resilient nature, equal to "Sof-Rod" made by Nomaco Inc. or approved equal, twenty-five (25) percent wider than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Provide back-up materials only as recommended by sealant manufacturer in writing.
- B. Provide bond breakers, where required, of polyethylene tape as recommended by manufacturer of sealant.
- C. Provide primers recommended by the sealant manufacturer for each material to receive sealant. Note that each exterior joint must be primed prior to sealing.

- D. Provide solvent, cleaning agents and other accessory materials as recommended by the sealant manufacturer.
- E. Materials shall be delivered to the job in sealed containers with manufacturer's original labels attached. Materials shall be used per manufacturer's printed instructions.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where joint sealers are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions required by this Project where more stringent installation requirements are specified herein, such requirements shall apply.
- B. Comply, at minimum, with sealant and sealant primer manufacturer's recommendations for space ventilation during and after installation. Where feasible, the following ventilation conditions shall be maintained during the sealant/sealant primer curing period or for 72 hours after installation: 1) supply 100% outside air 24 hours a day; 2) supply airflow at a rate of 6 air changes per hour, when outside temperatures are between 55 deg. F and 85 deg. F and humidity is between 30% and 60%; and 3) supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated in item 2 above.
- C. To the extent practical, allow sealant and sealant primer installations to cure prior to the installation of materials that adsorb VOCs. Materials that adsorb VOCs include carpets, textiles, unprimed gypsum wallboard, and acoustical ceiling panels.
- D. Sample Section of Sealant
 - 1. During sealant installation work in exterior wall, the manufacturer of sealant shall send his representative to the site, under whose supervision a section of the wall (used as "control section") shall be completed for purposes of determining performance characteristics of sealant in joints. Architect shall be informed of time and place of such installation of control section.
 - 2. Control section shall be installed according to specification given herein and shall not be considered as acceptable until written acceptance is provided by the Architect.
 - 3. Accepted control section shall be standard to which all other sealant work must conform.

- E. Supervision: The Contractor shall submit to the Architect written certification from the sealant manufacturer that the applicators have been instructed in the proper application of their materials. The Contractor shall use only skilled and experienced workmen for installation of sealant.
- F. Apply sealant under pressure with a hand or power actuated gun or other appropriate means. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed. Neatly point or tool joint to provide the contour as indicated on the drawings.
- G. Preparation and Application
 - 1. Thoroughly clean all joints, removing all foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied film must be entirely removed.
 - 2. Stone, masonry and concrete surfaces to receive sealant shall be cleaned where necessary by grinding, water blast cleaning, mechanical abrading, or combination of these methods as required to provide a clean, sound base surface for sealant adhesion.
 - a. Do not use any acid or other material which might stain surfaces.
 - b. Remove laitance by grinding or mechanical abrading.
 - c. Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with compressed air, oil and water free, or vacuuming joints prior to application of primer or sealant.
 - 3. Clean non-porous surfaces such as metal and glass chemically. Remove protective coatings on metallic surfaces by solvent that leaves no residue and is compatible with sealant. Use solvent with clean, lint free paper towels, and wipe dry with clean, dry lint free paper towels. Do not allow solvent to air dry without wiping. Clean joint areas protected with masking tape or strippable films as above after removal of tape film.
 - 4. Do not seal joints until they are in compliance with drawings, or meet with the control section standard.
 - 5. Joint Size and Sealant Size: Joints to receive sealant shall be at least 1/4" wide. In joint 1/4" to 3/8" wide, sealant shall be 1/4" deep. In joints wider than 3/8" and up to 1" wide, sealant depth shall be one half the joint width. For joints wider than 1", sealant depth shall be as recommended by the sealant manufacturer. Depth of joint is defined as distance from outside face of joint to closest point of the filler.
 - 6. Primer: Thoroughly clean joints and apply primer to all surfaces that will receive sealant. Apply primer on clean, dry surfaces, and prior to installation of joint backing. Completely wet both inner faces of the joint with primer. Mask adjacent surfaces of joint with non-staining masking tape prior to priming.
 - 7. Joint Backing: In joints where depth of joint exceeds required depth of sealant, install joint backing (after primer is dry) in joints to provide backing and proper joint shape for sealant. Proper shape for sealant is a very slight "hourglass" shape,

with back and front face having slight concave curvature. Use special blunt T-shaped tool or roller to install joint backing to the proper and uniform depth required for the sealant. Joint backing shall be installed with approximately twenty-five (25) percent compressions. Do not stretch, twist, braid, puncture, or tear joint backing. Butt joint backing at intersections.

8. Bond Breaker: Install bond breaker smoothly over joint backing so that sealant adheres only to the sides of the joint and not backing.
9. Sealant Application: Apply sealant in accordance with the manufacturer's application manual and manufacturer's instructions, using hand guns or pressure equipment, on clean, dry, properly prepared substrates, completely filling joints to eliminate air pockets and voids. Mask adjacent surfaces of joint with non-staining masking tape. Force sealant into joint in front of the tip of the "caulking gun" (not pulled after it) and force sealant against sides to make uniform contact with sides of joint and to prevent entrapped air or pulling of sealant off of sides. Fill sealant space solid with sealant.
10. Tooling: Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C 1193. Finished joints shall be straight, uniform, smooth and neatly finished. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Neatly remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.
11. Replace sealant which is damaged during construction process.

END OF SECTION

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SECTION 081113

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the steel doors and frames work as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Interior and exterior hollow metal doors and frames for fire rated and unrated door openings.
 - 2. Interior hollow metal vision panels.
 - 3. Preparation of metal doors and frames to receive finish hardware, including reinforcements, drilling and tapping necessary.
 - 4. Preparation of hollow metal doors to receive glazing where required.
 - 5. Furnishing anchors for building into masonry and drywall.
 - 6. Factory prime painting of work of this Section.

1.3 RELATED SECTIONS

- A. Unit masonry - Section 042000.
- B. Installation of doors and frames - Section 062000.
- C. Finish hardware - Section 087100.
- D. Glass and glazing - Section 088000.
- E. Gypsum drywall - Section 092900.
- F. Painting - Section 099000.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, compliance with standards referenced herein, sound and fire-resistance ratings, and finishes for each type of door and frame specified.

- B. Shop Drawings: Show fabrication and installation of doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, reinforcement for surface applied hardware, dimensions of profiles and hardware preparation, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessories.
- C. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Drawings.
 - 1. Coordinate glazing frames and stops with glass and glazing requirements.
- D. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to comply with design, materials, and construction equivalent to requirements for labeled construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing custom steel doors and frames similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain custom steel doors and frames through one source from a single manufacturer.
- D. Fire-Rated Door and Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated.
 - 1. Test Pressure: Test according to NFPA 252 or UL 10C. After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40" or less above the sill.
 - 2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-protection-rated door assemblies except for size.
 - 3. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 250 deg. F. (or greater if required by Code) maximum in 30 minutes of fire exposure.
- E. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.
- F. For projects located in New York City, fire rated assemblies must have M.E.A. approval with UL label.

- G. Work of this Section must meet the minimum standards of ANSI 250.4 and SDI-100; where more stringent requirements are specified herein, such requirements shall apply.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletted, wrapped, or crated to provide protection during transit and Project site storage. Do not use nonvented plastic.
- B. Inspect doors and frames, on delivery, for damage. Minor damage may be repaired provided refinished items match new work and are approved by Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames under cover at building site. Conform to the requirements of ANSI A 250-11-2001 for site storage unless more stringent requirements are noted herein. Place units on minimum 4-inch high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

PART 2 PRODUCTS

2.1 FABRICATION - GENERAL

- A. Fabricate hollow metal units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable.
- B. Unless otherwise indicated, provide countersunk flat Phillips or Jackson heads for exposed screws and bolts.
- C. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with Finish Hardware Schedule and templates provided by hardware suppliers. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware."
- D. Locate finish hardware as shown on final shop drawings in accordance with locations noted herein.

2.2 MANUFACTURERS

- A. Provide products manufactured by Steelcraft, Curries, Ceko Door Products, or approved equal meeting these specifications.
 - 1. Manufacturer must be a member of the Steel Door Institute.

2.3 FRAMES

- A. Materials
 - 1. Frames for exterior openings shall be made of commercial grade cold-rolled steel conforming to ASTM A 1008/A, Type B not less than 14 ga., and shall have a hot

dipped galvanized coating conforming to ASTM A 924 and A 653 with A-60 coating. The zinc-alloy coating shall be a dull matte surface treated for paint adhesion.

2. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM A 1008/A, Type B or commercial grade hot-rolled steel conforming to ASTM A 1011/A, Commercial Steel, Type B. Metal thickness shall be not less than sixteen (16) ga. for frames in openings 4'-0" or less in width; not less than fourteen (14) ga. for frames in openings over 4'-0" in width.

B. Design and Construction

1. All frames shall be welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Unless otherwise noted, knock-down frames will not be accepted.
2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths.
3. Jamb depths, trim, profile and backbends shall be as shown on drawings.
 - a. Frames at drywall partitions shall be formed with double return backbends to prevent cutting into drywall surface.
4. Welded frames shall have corners mitered and reinforced and faces of welded frames shall be continuously back welded.
5. Minimum depth of stops shall be 5/8".
6. Frames for multiple or special openings shall have mullion and/or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
 - a. Mullions shall have 16 ga. internal steel stiffeners welded not less than 4" o.c.
7. Hardware Reinforcements
 - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully-templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates.
 - b. Minimum thickness of hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcements - seven (7) ga., 1-1/4" x 10" minimum size.
 - 2). Strike reinforcements - twelve (12) gauge
 - 3). Flush bolt reinforcements - twelve (12) gauge
 - 4). Closer reinforcements - twelve (12) gauge

- 5). Reinforcements for surface mounted hardware - twelve (12) gauge.
8. Floor Anchors
 - a. Provide adjustable floor anchors, providing not less than two (2) inch height adjustment.
 - b. Minimum thickness of floor anchors shall be fourteen (14) gauge.
9. Jamb Anchors
 - a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the wire type. Anchors shall be not less than 0.156" diameter steel wire. The number of anchors provided on each jamb shall be as follows:
 - 1). Frames up to 7'-6" height - three (3) anchors.
 - 2). Frames 7'-6" to 8'-0" height - four (4) anchors.
 - 3). Frames over 8'-0" height - one (1) anchor for each 2'-0" or fraction thereof in height.
 - b. Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than eighteen (18) gauge thickness, securely welded inside each jamb as follows:
 - 1). Frames up to 7'-6" height - four (4) anchors.
 - 2). Frames 7'-6" to 8'-0" height - five (5) anchors.
 - 3). Frames over 8'-0" height - five (5) anchors plus one additional for each 2'-0" or fraction thereof over 8'-0".
 - c. Frames to be anchored to previously placed concrete or masonry shall be provided with minimum 3/8" concealed bolts set into expansion shields or inserts at six (6) inches from top and bottom and twenty-four (24) inches o.c. Reinforce frames at anchor locations with sixteen (16) gauge sheet steel stiffeners welded to frame at each anchor.
10. Anchors in exterior frames and in masonry walls shall be hot dip galvanized per ASTM A 153.
11. Frames for installation in masonry wall openings more than 4'-0" in width shall have an angle or channel stiffener factory welded into the head. Such stiffeners shall be not less than twelve (12) gauge steel and not longer than the opening width, and shall not be used as lintels or load bearing members.
12. Dust cover boxes (or mortar guards) of not thinner than twenty-six (26) gauge steel shall be provided at all hardware mortises on frames to be set in masonry or plaster partitions.
13. Ceiling Struts: Minimum 3/8" thick x 2" wide steel.
14. All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.
15. Loose glazing stops shall be of cold rolled steel, not less than twenty (20) gauge thickness, butted at corner joints and secured to the frame with countersunk

cadmium- or zinc-plated screws. Interior frames may be provided with snap-on glazing stops.

16. Except on weatherstripped frames, drill stops to receive three (3) silencers on strike jambs of single door frames and two (2) silencers on heads of double-door frames.

C. Finish: After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall then be chemically treated to insure maximum paint adhesion and shall be coated on all surfaces with one coat of rust-inhibitive baked-on alkyd primer standard with the manufacturer which is fully cured before shipment to a dry film thickness of 2.0 mils.

1. Frames set in masonry walls shall be grouted in as described in Section 04800 – Unit Masonry. These frames shall have surfaces in contact with grout shop coated with epoxy coating equal to Series 27 FC Typoxy made by Tnemec or approved equal spray applied at 4 to 6 mils, passing NFPA 101, Class A for smoke and flame spread, tested per ASTM E 84.

2.4 HOLLOW METAL DOORS

A. Materials: Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A 1008/A, Commercial Steel, Type B and free of scale, pitting or other surface defects. Face sheets for interior doors shall be not less than eighteen (18) gauge. Face sheets for exterior doors shall be not less than sixteen (16) gauge and shall have a hot dipped galvanized coating conforming to ASTM A 924 and A 653, A-60 coating. The zinc alloy coating shall be a dull matte surface treated for paint adhesion.

B. Design and Construction

1. All doors shall be custom made, of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4".
2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckles. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.
3. Core Construction: Resin impregnated Kraft paper with maximum 1" cells; fastened to face sheets with waterproof adhesive.
 - a. Fire Rated Door Core: As required to provide fire-protection and temperature rise ratings indicated.
4. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
5. Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than fourteen (14) gauge, extending the full width of the door and

spot welded to both faces. Exterior doors shall have an additional flush closing channel at their top edges and, where required for attachment of weatherstripping, a flush closure also at their bottom edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.

6. Edge profiles shall be provided on both vertical edges of doors as follows:

- a. Single-acting swing doors - beveled 1/8" in two (2) inches.
- b. Double acting swing doors - rounded on 2-1/8" radius.
- c. No square edge doors permitted.

7. Hardware Reinforcements

- a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closers, etc.) is to be applied, doors shall have reinforcing plates.
- b. Minimum gauges for hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcement - seven (7) gauge.
 - 2). Reinforcement for lock face, flush bolts, concealed holders, concealed or surface mounted closers - twelve (12) gauge.
 - 3). Reinforcements for all other surface mounted hardware - sixteen (16) gauge.

8. Glass Moldings and Stops

- a. Where specified or scheduled, doors shall be provided with hollow metal moldings to secure glazing by others in accordance with glass opening sizes shown on drawings.
 - b. Fixed moldings shall be securely welded to the door on the security side.
 - c. Loose stops shall be not less than twenty (20) gauge steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws spaced eight (8) inches o.c. Snap-on attachments will not be permitted. Stops shall be flush with face of door.
- C. Finish: After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall then be chemically treated to insure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive alkyd primer as specified for frames which shall be fully cured before shipment.
- D. Flatness: Doors shall maintain a flatness tolerance of 1/16" maximum, in any direction, including in a diagonal direction.

2.5 LABELED DOORS AND FRAMES

- A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings as scheduled on drawings. Such doors and frames shall be labeled by Underwriters' Laboratories or other nationally recognized agency having a factory inspection service.
- B. If any door or frame specified by the Architect to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Architect shall be so advised before fabricating work on that item is started.

2.6 HARDWARE LOCATIONS

- A. The location of hardware on doors and frames shall be as follows unless otherwise required by prevailing Handicapped Codes:
 - 1. Hinges: Top 5" from head of frame to top of hinge; bottom $10" \pm 1"$ from finish floor to bottom of hinge; intermediate centered between top and bottom hinges.
 - 2. Unit and Integral Type Locks and Latches: 38" to centerline of knob.
 - 3. Deadlocks: 48" to centerline of cylinder.
 - 4. Panic Hardware: 40-5/16" to centerline of cross bar.
 - 5. Door Pulls: 42" to center of grip.
 - 6. Push-Pull Bars: 42" to centerline of bar.
 - 7. Push Plates: 48" to centerline of plate.
 - 8. Roller Latches: 45" to centerline.
 - 9. All of the above dimensions are from finished floor.

2.7 CLEARANCES

- A. Fabricate doors and frames to meet edge clearances as follows:
 - 1. Jambs and Head: $1/8"$ plus or minus $1/16"$.
 - 2. Meeting Edges, Pairs of Doors: $1/8"$ plus or minus $1/16"$.
 - 3. Bottom: $3/4"$, if no threshold.
 - 4. Bottom: $3/8"$, at threshold.
- B. Fire rated doors shall have clearances as required by NFPA 80.

2.8 MANUFACTURING TOLERANCES

- A. Manufacturing tolerance shall be maintained within the following limits:
 - 1. Frames for Single Door or Pair of Doors

- a. Width, Measured Between Rabbets at the Head
 - 1). Nominal opening width $+1/16"$, $-1/32"$
- b. Height (total length of jamb rabbet):
 - 1). Nominal opening height $+3/64"$
- c. Cross Sectional Profile Dimensions
 - 1). Face: $+1/32"$
 - 2). Stop: $+1/32"$
 - 3). Rabbet: $+1/64"$
 - 4). Depth: $+1/32"$
 - 5). Throat: $+1/16"$. Frames overlapping walls to have throat dimension $1/8"$ greater than dimensioned wall thickness to accommodate irregularities in wall construction.

2. Doors

- a. Width: $+3/64"$
- b. Height: $+3/64"$
- c. Thickness: $+1/16"$
- d. Hardware Cutout Dimensions
 - 1). Template dimensions $+0.015"$, $-0"$
- e. Hardware Location: $+1/32"$

2.9 PREPARATION FOR FINISH HARDWARE

A. Prepare door and frames to receive hardware:

- 1. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to insure correct fitting and installation.
- 2. Preparation includes sinkages and cut-outs for mortise and concealed hardware.

B. Provide reinforcements for both concealed and surface applied hardware:

- 1. Drill and tap mortise reinforcements at factory, using templates.
- 2. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.10 REJECTION

- A. Hollow metal frames or doors which are defective, have hardware cutouts of improper size or location, or which prevent proper installation of doors, hardware or work of other trades, shall be removed and replaced with new at no cost.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where steel doors and frames are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do

not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Refer to Section 062000 for installation procedures for all work of this Section.

END OF SECTION

SECTION 083113

ACCESS DOORS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the access doors as indicated on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Frameless recessed panel access doors at drywall ceilings and walls.
 - 2. Framed flush panel access doors at masonry and tile walls.
 - 3. Provide access doors and frames for access from occupied spaces to the following, where indicated or required, and as directed by the trades of Divisions 15 and 16.
 - a. All shutoff or balancing valves.
 - b. Fire dampers, as required.
 - c. Points of duct access.
 - d. Pull boxes.
 - e. Controls of mechanical and electrical items.
 - f. Masonry shafts for pipes and conduits, as required.
 - g. Pipe spaces, if required.
 - h. Inlets of fans.
 - i. Fusible link and splitter damper at filter bank.
 - j. Automatic damper and motor.
 - k. Equipment not otherwise accessible.

1.3 RELATED SECTIONS

- A. Masonry - Section 042000.
- B. Drywall - Section 092900.
- C. Ceramic tile - Section 093000.
- D. Valves and connections - Division 22.

1.4 QUALITY ASSURANCE

- A. For actual installation of the work of this Section, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are completely trained in the skills required.
- B. Fire-Resistance Ratings: Wherever a fire-resistance classification is shown, or for construction where access doors are installed, provide required access door assembly with panel door, frame, hinge and latch from manufacturers listed in Underwriters' Laboratories, Inc. "Classified Building Materials Index" for the rating shown.
 - 1. Provide UL label on each access panel.
 - 2. Provide flush, key operated cylinder lock.
- C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units which may vary slightly from sizes shown or scheduled.

1.5 SUBMITTALS

- A. Before any materials of this Section are delivered to the job site, submit complete manufacturer's literature to the Architect. Submit plans and schedules showing size and location of each and every access door for Architect's acceptance prior to installation.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 MATERIALS AND FABRICATION

- A. Provide access door assembly manufactured by Milcor Inc, or equal made by Nystrom Inc., Karp Associates, Inc. or approved equal. Assembly shall be an integral unit complete with all parts and ready for installation.
- B. Fabricate units of continuous welded steel construction. Grind welds smooth and flush with adjacent surfaces. Provide attachment devices and fasteners of the type required to secure access panels to the types of supports shown.
- C. Frames for Masonry and Tile Wall Only (Flush Panel Units)
 - 1. Fabricate frame from sixteen (16) gauge steel. Provide frame with exposed flange not less than one (1) inch wide around perimeter of frame for the following construction:
 - a. Exposed masonry.

- b. Tile finish.
- 2. For installation in masonry construction, provide frames with adjustable metal masonry anchors.
- D. Frameless Units for Drywall Surfaces (Recessed Panel Units): Provide access doors without exposed frames for drywall adhered to recessed panel.
- E. Panels: Fabricate from fourteen (14) gauge steel, with concealed spring hinges set to open to 175 degrees. Provide removable pin type hinges of the quantity required to support the access panel sizes used in the work. Finish with manufacturer's factory applied baked enamel prime coat applied over phosphate protective coating on steel.
- F. Locking Devices
 - 1. For non-rated access doors, provide flush, screwdriver operated cam locks of number required to hold door in flush, smooth plane when closed.
 - 2. For fire rated doors, provide locks as described in paragraph 1.04, B. herein.
- G. Inserts and Anchorage: Furnish inserts and anchoring devices which must be built into masonry for the installation of access panels. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where access doors are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 COORDINATION

- A. Coordinate all work with the mechanical trades to insure proper locations and in a timely manner to permit orderly progress of the total work.
- B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- C. Adjust hardware and panels after installation for proper operation.
- D. Remove and replace panels or frames which are warped, bowed, or otherwise damaged.

END OF SECTION

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SECTION 083600

SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the sectional overhead doors, as shown on the drawings, and/or specified herein, including, but not limited to, the following:
 - 1. Steel sectional overhead doors.
 - 2. Tracks and hardware.
 - 3. Motor operation.

1.3 RELATED SECTIONS

- A. Finish painting - Section 099000.
- B. Electric power - Division 26.

1.4 QUALITY ASSURANCE

- A. Provide each sectional overhead door as a complete unit produced by one manufacturer, including frames, sections, brackets, guides, tracks, counterbalance mechanisms, hardware, operators and installation accessories, to suit openings and head room allowable.
- B. Unless otherwise acceptable to Architect, furnish sectional overhead door units by one manufacturer for entire project.
- C. Wind Loading: Design and reinforce sectional overhead doors to withstand a 30 lb. per sq. ft. wind loading pressure with a maximum deflection of 1/120 of opening width.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of overhead door. Include manufacturer's operating instructions and maintenance data.
- B. Shop drawings: Submit shop drawings for special components and installations which are not fully dimensioned or detailed in manufacturer's data.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide Iso-Dor Model SI-2024A as manufactured by Fimbel Door Company, with one window on the right hand side. Substitutions are not permitted.

2.2 MATERIALS

- A. Construct door sections from 20 ga. exterior, and 24 ga. interior galvanized structural quality carbon steel sheets complying with ASTM A 924, with a minimum yield strength of 33,000 psi, and a minimum G90 zinc coating complying with ASTM A 653. Sheet shall be ribbed or fluted to suit manufacturer's standard.
- B. Fabricate sections from a single sheet to provide units not more than 24" high, and nominal 2" deep. Roll horizontal meeting edges to a continuous shiplap rabbeted, or keyed weather seal, with a reinforcing flange return.
- C. Enclose open section with 16 ga. galvanized steel channel end stiles welded in place. Provide intermediate stiles, cut to door section profile, spaced at not more than 48" o.c. and welded in place.
- D. Reinforce bottom section with a continuous channel or angle conforming to bottom section profile.
- E. Reinforce sections with continuous horizontal and diagonal reinforcing, as required by door width and design wind loading. Provide galvanized steel bars, struts, trusses or strip steel, formed to depth, and bolted or welded in place.
- F. Insulate inner core of steel sections with manufacturer's standard glass fiber, polystyrene, or polyurethane foam type insulation. Enclose insulation with manufacturer's standard steel sheet secured to door panel.
- G. Finish door sections as follows
 - 1. Pretreat zinc-coated steel with a zinc phosphate conversion coating after cleaning.
 - 2. Apply manufacturer's standard prime coat, applied to both door faces after forming.
- H. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of units. Provide setting drawings,

templates, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

1. See Concrete and Masonry Sections of these specifications for installation of inserts and anchorage devices.

2.3 TRACKS, SUPPORTS AND ACCESSORIES

- A. Tracks: Provide manufacturer's standard galvanized steel track system, sized for door size and weight, and designed for clearances shown. Provide complete track assembly including brackets, bracing and reinforcing for rigid support of ball bearing roller guides, for required door type and size. Slot vertical sections of track at 2" o.c. for door drop safety device. Slope tracks at proper angle from vertical, or otherwise design to ensure tight closure at jambs when door unit is closed. Weld or bolt to track supports.
- B. Track Reinforcement and Supports: Provide galvanized steel track reinforcement and support members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity, and to ensure against sag, sway, and detrimental vibration during opening and closing of doors. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling racks) with continuous angle welded to track and supported by laterally-braced attachments to overhead structural members at curve and end of tracks.
- C. Weather Seals: Provide continuous EPDM adjustable weatherstrip gasket at tops and compressible astragal on bottoms of each overhead door.
 1. In addition, provide continuous flexible seals at door jamb edges for a fully weathertight installation.
- D. Vision Panels: Except as otherwise indicated, furnish "B" grade double-strength sheet glass vision panels in arrangement shown. Set glass in rubber or neoprene channel glazing strips. Provide removable stops of same material as door section frames.

2.4 HARDWARE

- A. Provide heavy-duty, rust-resistant hardware, with galvanized fasteners, to suit type of door.
- B. Hinges: Provide heavy steel hinges at each end stile and at each intermediate stile, per manufacturer's recommendations for size of door. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners only where access to nuts is not possible. Provide double-end hinges, where required, for doors exceeding 16'-0" in width, unless otherwise recommended by door manufacturer.
- C. Rollers: Provide heavy-duty rollers, with steel ball bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide case-hardened roller tires to suit size of track (3" dia. for 3" track; 2" dia. for 2" track).

2.5 COUNTERBALANCING MECHANISMS

- A. Hang door assembly for operation by heavy duty torsion type counterbalance mechanism with oil tempered helical wound springs sprung for size and weight of door. Mechanism shall be capable of a minimum life of 100,000 cycles.

2.6 ELECTRIC DOOR OPERATIONS

- A. Provide electric door operator assembly of the size and capacity recommended and provided by the door manufacturer, complete with electric motor and factory-prewired motor controls, gear reduction unit, solenoid operated brake, clutch, remote control stations and control devices. Operator shall be trolley type with worm gear drive.
- B. Provide a hand-operated disconnect or a mechanism for automatically engaging a sprocket chain operator and releasing brake for emergency manual operation. Include an interlock device to automatically prevent the motor from operating when emergency sprocket is engaged.
- C. Design operator so that motor may be removed without disturbing the limit-switch adjustment and without affecting the emergency auxiliary operator.
- D. Provide high-starting torque, reversible, constant duty, Class A insulated electric motors with overload protection, sized to move door in either direction, from any position, at not less than 2/3' or more than 1' per second. Coordinate wiring requirements and current characteristics of motors with electrical system of the building; see Division 16 Sections of these specifications.
- E. Provide momentary-contact, 3-button control station with push button controls labeled "open," "close" and "stop" enclosed in general purpose NEMA Type 1 enclosure.
- F. Automatic Reversing Control: Furnish each door with automatic safety switch, extending full width of door bottom, and located within neoprene or rubber astragal mounted to bottom door rail. Contact with switch will immediately reverse downward door travel. Furnish manufacturer's standard take-up reel or self-coiling cable.
 - 1. Provide electrically actuated automatic bottom bar.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where sectional overhead doors are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install door, track, and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports in accordance with final shop drawings, manufacturer's instructions and as herein specified.

- B. Fasten vertical track assembly to framing at not less than 24" o.c. Hang horizontal track from structural overhead framing with angle or channel hangers, welded and bolt-fastened in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door operating equipment.
- C. Upon completion of installation, including work by other trades, lubricate, test and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

3.3 MAINTENANCE

- A. Provide scheduled maintenance as per manufacturers specifications for doors, tracks and electric operators for a period of 12 months to commence at date of Substantial Completion.

END OF SECTION

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SECTION 084413

STRUCTURAL SEALANT GLAZED CURTAIN WALLS

PART 1-GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the glazed aluminum curtain wall assemblies as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Four-sided structural sealant glazed aluminum and glass curtain wall assemblies.
 - 2. Glass and glazing in conjunction with work of this Section.
 - 3. All necessary steel or aluminum members where required to support, strengthen and/or reinforce aluminum members.
 - 4. Sealants, caulking, joint fillers, gaskets, fasteners, vents and weeps, weep tubes, bellows, closures, gutters, end dams, flashings, copings, trim, as shown or as may be required in conjunction with the system or to joint the system to adjacent construction.
 - 5. Anchors, inserts and insert setting diagrams, furnishing of inserts and insert setting diagrams, support brackets, reinforcing, bracing, stiffeners, flashing.

1.3 RELATED SECTIONS

- A. Miscellaneous metals - Section 055000.
- B. Firestops and smoke seals - Section 078413.
- C. Sealant work - Section 079200.
- D. Aluminum and glass entrance doors - Section 084113.
- E. Finish hardware - Section 087100.
- F. Glazing and glazing - Section 088000.

1.4 REFERENCE STANDARDS

- A. Aluminum Association (AA).
- B. National Association of Architectural Metal Manufacturers (NAAMM).

- C. Architectural Aluminum Manufacturers Assoc. (AAMA).
- D. American Welding Society (AWS).
- E. American National Standards Institute (ANSI).

1.5 PLANS AND SPECIFICATIONS

- A. The drawings (building elevations, floor plans and design details) and specifications are an outline of the criteria and performance requirements of the work. The requirements shown by the details are intended to establish basic dimensions of the module and the site lines and profiles of members. Within these parameters, the Contractor is responsible for the design and engineering of the system, including whatever modifications or additions may be required to meet the specified requirements and maintain the visual design concept for the entire project.
- B. Contractor shall submit, along with his bid, sketches showing how he will address typical conditions for each type of unit.
- C. It is recognized that the design details may not cover many conditions. It is, however, intended that conditions not detailed shall be developed through the Contractor's shop drawings to the same level of aesthetics and in compliance with performance criteria, as indicated for detailed areas and stipulated in these specifications. The Contractor, by accepting a contract for the work, acknowledges this and agrees that the Architect shall have the final say as to all matters, whether detailed or not, on the design details.

1.6 PERFORMANCE REQUIREMENTS

- A. Wind Loads: Provide glazed aluminum curtain wall system, including anchorage, capable of withstanding wind-load design pressures of 38 psf in the corner zone (8 feet length from each corner on each side) and 25 psf everywhere else.
- B. Structural-Test Performance: Provide glazed aluminum curtain-wall systems tested according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Duration: As required by design wind velocity but not less than 60 seconds.
- C. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches, and 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
- D. Seismic Loads: Provide glazed aluminum curtain wall system, including anchorage, capable of withstanding the effects of earthquake motions calculated according to

prevailing Codes and the requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever are more stringent.

- E. Dead Loads: Provide glazed aluminum curtain wall system members that do not deflect an amount which will reduce glazing bite below 75 percent of design dimension when carrying full dead load. Provide a minimum 1/8" clearance between members and top of fixed panels, glazing, or other fixed part immediately below. Provide a minimum 1/16" clearance between members and doors.
- F. Live Loads: Provide glazed aluminum curtain wall system, including anchorage, that accommodates deflection of supporting structure from uniformly distributed and concentrated live loads on floors or horizontal load bearing elements to which the wall is anchored without failure of materials or permanent deformation.
 - 1. Snow loads due to drifting.
- G. Air Infiltration: Provide glazed aluminum curtain wall system with permanent resistance to air leakage through system of not more than 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq. ft.
- H. Water Penetration: Provide glazed aluminum curtain wall system that does not evidence water leakage when tested according to ASTM E 331 at minimum differential pressure of 20 percent of inward acting wind-load design pressure as defined by ASCE 7, "Minimum Design Loads for Buildings and Other Structures," but not less than 10 psf static pressure differential.
 - 1. Uncontrolled water infiltrating system or appearing on system's normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that are drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.
- I. Thermal Movements: Provide glazed aluminum curtain wall system, including anchorage, that accommodates thermal movements of system and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, water leakage, damaging loads on fasteners, noise or vibration, and other detrimental effects.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- J. Structural Sealant: Provide manufacturer's structural sealant glazed curtain wall system that has been tested to demonstrate that tensile or shear stress in structural silicone joints is not in excess of 20 psi with modulus of elasticity to allow no more than 25 percent movement of joint width, or less if required by sealant manufacturer.
- K. Condensation Resistance and Thermal Transmittance Performance Requirements: Perform thermal tests in accordance with AAMA 1503.1 procedure, or provide finite element computer thermal modeling per THERM 5.2 and WINDOW 5.2 on the configuration specified in AAMA 1503.1.

1. Thermal Transmittance ("U" Factor): No component of the curtain wall assembly shall have a U value above 0.xx BTU/hr/sf/deg F at 15 mph exterior wind.
2. Condensation Resistance Factor (CRF): CRF minimum xx (frame) and minimum xx (glass).

1.7 SUBMITTALS

- A. Submit Product Data for each product specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Submit Shop Drawings showing fabrication and installation of glazed aluminum curtain wall system including plans, elevations, sections, details of components, and attachments to other units of Work.
 1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by a professional engineer licensed in the State of New York responsible for their preparation.
- C. Submit samples for verification of each type of exposed finish required in manufacturer's standard sizes. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
 1. Submit 12" x 12" samples of each glass type.
- D. Submit cutaway sample of each vertical-to-horizontal intersection of system, made from 12-inch lengths of full-size components and showing details of the following:
 1. Joinery.
 2. Anchorage.
 3. Expansion provisions.
 4. Glass and glazing.
 5. Flashing and drainage.
- E. Submit Glazing Schedule.
- F. Submit welder certificates indicating that welders comply with requirements specified in "Quality Assurance" Article.
- G. Submit installer certificates signed by manufacturer certifying that installers comply with requirements in "Quality Assurance" Article.
- H. Submit product test reports evidencing compliance of glazed aluminum curtain wall system with requirements based on comprehensive testing of manufacturer's current system.

1.8 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of New York, and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of glazed aluminum curtain wall systems that are similar to those indicated for this Project in material, design, and extent.
- B. Installer Qualifications: The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.
 - 1. Engineering Responsibility: Engage a qualified professional engineer to prepare or supervise the preparation of data for glazed aluminum curtain wall systems, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that shows compliance of system with specified requirements.
- C. Source Limitations: Obtain each type of glazed aluminum curtain wall system from one source and by a single manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of the system. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sight lines and relationships to one another and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, or in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."
 - 1. Engage welders who have satisfactorily passed AWS qualification tests for welding processes involved and who are currently certified for these processes.
- F. Mockups: Prior to installing glazed aluminum curtain wall system, construct mockups for each form of construction and finish required, to verify selections made under Sample submittals and to demonstrate aesthetic effects, as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for Work.
 - 1. Mockups shall be of the size indicated or, if not indicated, as directed by Architect. Mock-up can be installed in place or at a remote location on the site.
 - 2. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.

3. Demonstrate the proposed range of aesthetic effects and workmanship. Correct any rejected work before start of work.
 4. Obtain Architect's written approval of mockups before start of Work.
 5. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. Approved mockups in an undisturbed condition may become part of the completed Work.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to glazed aluminum curtain wall system including, but not limited to, the following:
1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 2. Review structural loading limitations.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review required inspecting, testing, and certifying procedures.
 5. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.10 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of a glazed aluminum curtain wall system that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including, but not limited to, excessive deflection.
2. Noise or vibration caused by thermal movements.
3. Failure of system to meet performance requirements.
4. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
5. Failure of operating components to function normally.
6. Water leakage.
7. Glazing breakage.

C. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 BASIS OF DESIGN

- A. Basis-of Design Product: Design is based on 8750 SG Series Four Sided Structural Glazed Curtainwall as manufactured by Wausau Window and Wall Systems. Subject to compliance with requirements, provide either the named product or approved equal.
1. Project-Out Vents: As standard with system.

2.2 METALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.
1. Sheet and Plate: ASTM B 209.
 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.
- B. Steel Reinforcement: ASTM A 36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 for hot-rolled sheet and strip.

2.3 GLASS AND GLAZING MATERIALS

- A. Glass shall conform to product requirements specified in Section 088000.
- B. Sealed Insulating Glass: Provide manufacturer's standard preassembled dual-seal insulating glass units consisting of organically sealed panes of 1/4" thick clear float glass enclosing a hermetically sealed dehydrated 1/2" air space. Provide units with a silicone secondary seal with an IGCC-certified CBA level compatible with structural silicone sealant.
1. Comply with requirements of Section 088000 including those specified by reference to ASTM E 774 for performance Class A.

2. Units shall be certified compatible by the sealant manufacturer. Insulating glass seals shall be certified to withstand project structural loading requirements.

C. Elastomeric Gaskets, Weatherstrips and Blocks

1. Glazing gaskets, sealant backers within glazing pockets, and continuous glass spacer pads at structural silicone shall be black heat cured silicone rubber conforming to ASTM C 1115, Type C.
2. Silicone gaskets and sheet used to absorb movement at expansion joints shall conform to ASTM C 1115, Type T.
3. Gaskets which maintain glass face clearance while serving as a backer for a silicone weather seal may have a friction fit. All other gaskets and weatherstrips, including backers for structural silicone, shall have a continuous spline or a continuous groove which engages a matching groove or leg on the aluminum frame.
4. Norton V2100 Thermalbond Tape is acceptable as a glass spacer pad when used in conjunction with structural silicone, subject to verification of compatibility.
5. Setting Blocks
 - a. Setting blocks shall be dense extruded neoprene, silicone or EPDM with hardness of 85 ± 5 durometer Shore A, minimum length 4 inches and minimum width corresponding to glass thickness. Setting blocks shall be equidistant from glass centerline. Location of setting blocks at glass quarter points is acceptable. Distance from vertical glass edge to nearest edge of setting block shall not be less than six inches, or 0.125 times glass width, whichever is greater.
 - b. Shims used in conjunction with setting blocks shall be of the same material, hardness, length and width as the blocks.
 - c. Setting blocks and chairs shall be secured against migration.
 - d. Silicone setting blocks are required where structural silicone occurs at sill.
6. Side Blocks
 - a. Provide side blocks at both jambs, between midheight and top corner of glass. Blocks shall be 55 ± 5 durometer Shore A dense neoprene, silicone or EPDM. Block width shall be 0.125 inch less than nominal glass edge clearance.
 - b. Side blocks are not required where glass is continuously sealed with silicone at two or more edges.
 - c. Extruded silicone side blocks are acceptable for insulating glass units with silicone edge seals.

2.4 SEALANTS (STRUCTURAL)

- A. All components which are adhered with a structural silicone sealant/adhesive as part of the fabrication, glazing or erection procedure, shall be sealed/adhered with an approved structural silicone, as manufactured by General Electric, Dow Corning or equal, and

approved by the Architect. All glazing with structural silicone sealant/adhesive shall be accomplished in a shop wherever consistent with the design.

- B. In using specified sealants, strictly observe the printed instructions of sealant manufacturer regarding joint size, limitations, backer rod, mixing, cleaning, surface preparation, priming and application. A primer shall be used, unless printed instructions advise to the contrary. Sealant shall not be applied when substrates are wet or when the temperature is below 40 deg. F. Units shall not be moved until structural silicone seal has achieved full cure.
- C. Care shall be exercised to insure against "Three Surface Adhesion." Bond breakers shall be provided where necessary.
- D. Contractor shall provide certification from sealant manufacturer that the sealant manufacturer has reviewed all sealant details and tested all contact surfaces, and finds same suitable for use with proposed sealant, the purpose intended and compatible with the surfaces with which they are in contact. Sealant manufacturer's certification shall include the following based upon tests performed on production run materials:
 - 1. Test data of adhesion to production samples of metal and glass, tested in accordance with ASTM C 794.
 - 2. Compatibility statement that the materials in contact with the sealant such as gaskets, spacers, setting blocks, are compatible with the sealant after 21 days exposure to ultra violet, 2000 - 4000 (micro watt u.v. radiation).
 - 3. Stress statement that when exposed to the specified wind load the stress in the silicone sealant of dimensions shown does not exceed 20 psi with a safety factor of 6:1.
- E. Where silicone bonds to a metal or glass surface, the weakest element in the line of stress must have a minimum strength of 120 psi. For each combination of substrates submit report from an independent laboratory for tests performed in the following manner:
 - 1. Assemble and fully cure a minimum of 6 samples using actual substrates and a minimum sample length of 5".
 - 2. Subject sample to a tensile load such that nominal stress on silicone is 20 psi, hold for one minute and remove load. Repeat for additional loadings, increasing nominal silicone stress by 20 psi with each successive loading. Continue until failure occurs or until 200 psi is successfully applied.
 - 3. All 6 samples must successfully withstand at least 120 psi. Report maximum stress and mode of failure. If one or more samples does not meet this criteria, revise failed element and repeat tests with 6 new samples. Repeat until all 6 samples are successfully tested.
 - 4. Testing shall be performed in such a manner as to establish stress and safety factor over the temperature range described herein.

5. Prepare an outline for a quality assurance program for evaluation of adhesion and other physical attributes of sealants and submit to Architect for review and approval.
6. Program shall cover both initial testing of components for sealant adhesion/compatibility, etc., and also random testing of production run materials, etc. Include testing at full negative design pressure, one unit per one hundred units manufactured for the project. Also include methods which will be employed to monitor sealant application to insure full sealant contact. No sealant work shall be performed prior to approval of program.

2.5 MISCELLANEOUS MATERIALS

- A. Provide straps, plates and brackets, built-in inserts, as required for support and anchorage of the fabricated items to adjacent surfaces.
- B. Brackets, Shims, and Reinforcements
 1. Provide aluminum and/or steel brackets, clips, shims and reinforcements as required.
 2. Where welding to embed plates in pre-cast concrete panels, provide stainless steel anchorage devices; stainless steel shall conform to ASTM A 666, Type 304.
 3. Where steel reinforcement of units is required for strength or other unavoidable necessity and concealed within (encased) in aluminum sections or employed in potentially wetted areas, hot dip galvanize the pieces after fabrication with 2.0 ounce zinc coating, complying with ASTM A 123. All other steel reinforcement shall be coated with two heavy coats of zinc rich primer in differing colors.
- C. Fabricate miscellaneous anchorage devices and support brackets from steel shapes, plates and bars of sizes indicated to meet structural loading criteria. Where no thickness is indicated 12 gauge is minimum allowable. Coat steel with two heavy coats of zinc rich primer in different colors.
- D. Fasteners, General: Provide type and size shown, or as required, for proper support and performance, fabricated of non-magnetic stainless steel. Bolts and nuts of zinc coated steel, complying with ASTM A 307, Grade A (and ASTM A 53), may be used for concealed assembly and anchorage in locations not exposed to the weather where joining steel members to steel members only.
- E. Slip Joint Linings/Sleeves: Provide stainless steel sleeve spacers and/or suitable bearing pads, as required, to insure free movement between surfaces where expansion and deflection movements are intended. Provide "Eel Slip," "Nylatron" or high impact polystyrene shims or pads or equivalent plastic units of sizes and thicknesses (minimum 1/16" except 1/8" for "Eel Slip") recommended by the manufacturer to permanently prevent "freeze up" of joints. All sleeves, spacers, bracing pads and shims must be incombustible and rated by UL.
- F. Flashing required within the system shall be stainless steel or aluminum and of approved design.

- G. Flashing required to join the system to adjacent construction shall be 26 gauge stainless steel.

2.6 FABRICATION

- A. General: Fabricate glazed aluminum curtain wall system according to approved Shop Drawings. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to approved Shop Drawings.
- B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- C. Prepare components to receive concealed fasteners and anchor and connection devices.
- D. Fabricate components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
- E. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld before finishing components. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Protect glass and glazing from exposure to weld splatter. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- F. Glazing Pockets: Provide minimum clearances for thickness and type of glass indicated according to GANA's "Glazing Manual."
- G. Glazing Pockets: Provide minimum clearances for thickness and type of panels indicated according to panel manufacturer's recommendations.
- H. Frame Units: Factory assemble frame units according to Shop Drawings to greatest extent possible. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Assemble components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
 - 1. Install glazing according to approved Shop Drawings.
- I. Systems with glass supported at all edges by structural silicone shall be unitized and shall be fully assembled, including silicone and glass, in the shop.

2.7 ALUMINUM DOOR FRAMING SYSTEM

A. Tubular Framing:

1. Size and Type: As indicated on the Drawings.
2. Materials: Aluminum Alloy 6063-T5, 1/8-inch minimum wall thickness.
3. Applied Door Stops: 0.625-inch high, with screws and weatherstripping. Door stop shall incorporate pressure gasketing for weathering seal. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
4. Frame Members: Box type with 4 enclosed sides.
5. Caulking: Caulk joints before assembling frame members.
6. Joints: Secure with fasteners; provide hairline butt joint appearance.
7. Hardware
 - a. Schlage Lever Handle – Rhodes Model RHO (L-series 06) – Finish 619.
 - b. See Door Schedule for locking requirements.
 - c. Premachine and reinforce frame members for hardware in accordance with manufacturer's standards and hardware schedule.
 - d. Factory install hardware.
8. Anchors
 - a. Anchors appropriate for wall conditions to anchor framing to wall materials.
 - b. Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.

2.8 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. High-Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer XL metallic color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions. Color: Clear Anodized Aluminum.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of glazed aluminum curtain wall

system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing glazed aluminum curtain wall system. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Provide means to drain water to the exterior to produce a permanently weatherproof system.
- B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- C. Install components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
- D. Install framing members plumb and true in alignment with established lines and grades.
- E. Install factory-assembled frame units plumb and true in alignment with established lines and grades.
- F. Anchorage: After system components are positioned, fix connections to building structure as indicated on Shop Drawings.
 - 1. Provide separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- G. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- H. Glass and Glazing
 - 1. Glazing shall be performed by skilled workmen in accordance with the best trade practices, the recommendations of GANA's Glazing Manual, and without springing or forcing. All instructions of the glass and glazing materials manufacturers shall be followed.
 - 2. Glass and glazing materials shall be compatible with each other and adequate for their intended purpose. Each material type shall be as per details and approved shop drawings.
 - 3. Protect all adjoining surfaces not to glazing materials against staining or damage of any kind.
 - 4. Glazing rabbets shall be clean, dry and free of any materials that might adversely affect the bond and seal of the glazing materials or the drainage of the rabbet.

5. Install glass and glazing under materials unless recommended otherwise by the manufacturer.
6. Prime all surfaces to receive glazing materials unless recommended otherwise by the manufacturer.
7. Use no sealant that has started to set in its container, nor any sealant that has exceeded the shelf life published by the Architect.
8. All wet-sealed glazing beads shall be installed in such a way as to result in neat, uniform beads with straight consistent edges. Protect all adjoining surfaces not to receive sealant against staining by masking. Tool all sealant to receive a consistent flare sloping away from the glass.
9. Setting and load-transfer blocks shall be 85 \pm 5 Shore A durometer extruded Neoprene (polychloroprene), Alcryn, or silicone rubber; at least 1/4 inch in thickness, full width of the rabbet, and placed at the glass quarter points or where recommended by the glass manufacturer and the guidelines of GANA's Glazing Manual. They shall be of a length recommended by the glass manufacturer and be placed or configured in such a way as not to impede drainage of water from the glazing rabbet.
10. Jamb blocks shall be used on each glass unit supported on four sides. The blocks shall be 60 \pm 5 Shore A durometer extruded Neoprene (polychloroprene), EPDM, Alcryn or silicone rubber, and shall be placed at the top of the rabbet, 1/8" clear of the glass edge, as recommended in GANA's Glazing Manual.
11. All glazing gaskets shall be injection-molded, vulcanized, or heat-welded at the corners to form a continuous closure.
12. Glass shall be centered in each opening to provide the purchases and clearances as recommended by the glass manufacturer.
13. Apply no tapes, ribbons or markings to the glass.

I. Sealant and Gasket Applications

1. Sealing mechanisms (sealant and gaskets) shall be provided where indicated on the Drawings or where required for a permanently weathertight installation. The sealing mechanism for each location and use shall be as indicated on approved shop drawings. In those locations where a mechanism is necessary but is not indicated, it shall be of a type recommended by the Contractor and approved by the Architect.
2. The design of all sealed joints shall be in accordance with the recommendations of the sealant and/or gasket manufacturer.
3. All sealant joints exposed to view shall be installed in such a way as to result in neat, uniform beads with straight consistent edges. Protect all adjoining surfaces not to receive sealant against staining by masking. Sealant joints shall be concealed from view to the extent possible.

4. Joints and joint surfaces shall be clean, dry and free of any materials that may have an adverse effect on the performance of the sealant and gasket materials.
 5. Apply sealants and gaskets under the conditions recommended by the manufacturer(s). All surfaces to receive sealants shall be cleaned and primed in accordance with the recommendations of the sealant manufacturer. Do not use any sealant that has started to set in its container or a sealant that has exceeded the shelf life as published by the sealant manufacturer.
 6. Fill all joints continuously and completely with sealant, forming a uniform, neat, concave bead. Tape/mask adjacent surfaces to achieve a clean, even edge to the bead. Finish the material flush with adjoining surfaces unless otherwise shown on the Drawings. All sealant surfaces shall be tooled smooth. Immediately after tooling of joint, carefully remove masking tape.
- J. Erection Tolerances: Install glazed aluminum curtain wall system to comply with the following maximum tolerances:
1. Plumb: 1/16" in 10 feet; 1/8" in 40 feet.
 2. Level: 1/16" in 20 feet; 1/8" in 40 feet.
 3. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16"; where a reveal or protruding element separates aligned surfaces by less than 2", limit offset to 1/4".
 4. Location: Limit variation from plane or location shown on approved Shop Drawings to 1/8" in 12 feet; 1/4" over total length.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified independent testing agency to perform testing indicated.
- B. Air Infiltration: Test areas of installed system as directed by the Architect for compliance with system performance requirements according to ASTM E 783.
- C. Water Spray Test: Immediately after completing the installation of half full wall width by top to bottom one end of wall minimum area of glazed aluminum curtain wall system, test system for water penetration according to AAMA 501.2 in a two lights in both directions for each typical system as directed by Architect.
 1. Depending upon the prevalence or absence of leakage in the initial water penetration tests, and upon the measures adopted by the Contractor to eliminate the source of leakage (if any) from subsequently erected work, the Architect will determine the necessity of (and scope of) additional tests. All re-tests required by the Architect shall be performed by the Contractor at no additional cost to the Owner. Any corrective work required shall be the responsibility of the Contractor, along with the cost of re-testing, the costs incurred by the Architect, Owner and their Consultants. All remedial measures must maintain standards of quality and are subject to Architect's approval.

- D. Repair or remove Work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.
- E. Periodically test sealants in place for adhesion, using methods specified herein. Promptly replace any sealant, which does not adhere or fails to cure.
- F. Perform peel test on at least ten (10) 6'-0" sections of glass openings with field-applied structural silicone. Record date, location and results. Submit records for information only. Replace silicone, which fails tests.
- G. Test internal gutters by temporarily plugging weep holes and filling with water. After minimum of fifteen minutes, inspect for water leakage. Correct deficiencies and retest until successful tests are achieved. Remove weep hole plugs.

3.4 PROTECTION

- A. Provide final protection and maintain condition in a manner acceptable to manufacturer and Installer, to ensure glazed aluminum curtain wall system is without damage or deterioration at the time of Substantial Completion.
- B. Replace any material damaged during manufacturing, shipping, storage or erection.
- C. Protection materials shall be installed in manner that will not trap moisture or contaminate the Work of this section. Use protection materials suitable for the intended protection period.
- D. Immediately prior to completion of the Work, completely clean the Work of this section in accordance with the recommendations of the product manufacturers, without damage or staining to adjacent construction.

END OF SECTION

SECTION 087100

FINISH HARDWARE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to furnish all the finish hardware as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Installation of finish hardware - Section 062000.
- B. Steel doors and frames - Section 081113.
- C. Wood doors - Section 081416.
- D. Painting - Section 099000.

1.4 QUALITY ASSURANCE

- A. Hardware shall be suitable and adapted for its required use and shall fit its designated location. Should any hardware as shown, specified or required fail to meet the intended requirements or require modification to suit or fit the designated location, determine the correction or modification necessary and notify the Architect in ample time to avoid delay in the manufacture and delivery of hardware.
- B. For fire rated openings provide hardware complying with NFPA Standard No. 80. requirements of authorities having jurisdiction.
- C. Barrier Free Requirements: Maximum pressure applied to the latch area to open exterior doors shall not exceed fifteen (15) pounds. Interior doors which have a self-closing feature shall require pressure not to exceed five (5) pounds.

1.5 SUBMITTALS

- A. Before any finish hardware is ordered or purchased, submit catalog cuts and a complete Hardware Schedule of Finish Hardware. Each item listed in the Hardware Schedule shall be identifiable with respect to manufacture, brand, catalog number, material, and finish.
- B. Where submission differs from Schedule given herein, use different color or other means of identification to bring change to the attention of the Architect.

- C. Samples: Submit samples as requested by Architect. Do not proceed with installation until samples have been approved. Approved samples may be installed in the work after substantial completion of work. Samples shall include one (1) each of the following samples:

1. Hinge (each type).
2. Intermediate pivot.
3. Surface closer.
4. Lockset (office function).
5. Floor stop.

1.6 PRODUCT HANDLING

- A. Pack finish hardware in approved manufacturer's containers, complete with trimmings, bolts, screws, washers, etc., as required for application and securement. Each container shall bear a suitable label which shall state the quantity and kind of contents of said container, as well as identifying marks relating to the approved Hardware Schedule and its location in the project.
- B. Knobs, handles, pulls and other items of finish hardware with easily damaged finishes shall be individually wrapped before placing in containers and with sufficient sheet cloth or cotton-backed paper which shall be adequately tied with heavy strings; all as necessary to protect the finishes.
- C. Finish hardware shall be delivered, as directed, to the building site or the factories of the various fabricators of metal work to which such hardware is to be applied. Deliver hardware in the order required and in ample time to permit application at the building, or fabricators' shops, within the time required for the completion of the building.

1.7 JOB CONDITIONS

- A. Templates: Promptly following approval of the Hardware Schedule by the Architect, furnish and deliver template information, to the fabricators, of items to which finish hardware is to be applied.
1. Such deliveries shall be made in ample time to avoid delays in such work of said fabricators. Provide drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their work to receive the finish hardware.
- B. Cooperation and Coordination
1. Cooperate and coordinate work with that of other trades supplying materials or performing work in contact with, connecting to, underlying, or overlaying the work of this Section.
 2. Provide complete data of requirements for work of this Section to those other trades whose work is affected by or dependent upon the work of this Section.

3. Furnish all items to be built into other work in ample time to avoid delaying the progress of such work.
4. Examine all drawings covering the work of this Section and refer to all other drawings, including mechanical and electrical drawings, which may affect the work of this Section or require coordination by this trade.

PART 2 PRODUCTS

2.1 GENERAL

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated herein. Products are identified by using appropriate hardware designation numbers.
- B. Manufacturers are listed for each hardware type required. Provide either the product designated, or approved equal.
- C. Proprietary Products: References to specific proprietary products are used to establish minimum standards of utility and quality. Other materials may be considered by the Architect in accordance with the provisions of these specifications.
- D. Notwithstanding anything to the contrary in this specification or the drawings, the finish hardware shall conform to the requirements of governmental authorities having jurisdiction and such requirements shall be followed as if specifically set forth in this specification.
- E. Finish hardware shall conform to the applicable requirements of the American Insurance Association, and the National Board of Fire Underwriters' Laboratories, Inc., and other local authorities having jurisdiction, and each such item shall bear a label or mark of the Underwriters' Laboratories, Inc., indicating its conformity with such requirements for use in connection with its specified location.
- F. Finish hardware shall be uniform in color and finish and free from imperfections affecting its appearance, function, operation and serviceability. Such hardware shall be suited and adapted to its required use and shall fit its respective location.
- G. Where the finished shape or size of members receiving finish hardware are such as to prevent or render unsuitable the use of the specific types or sizes of such hardware, suitable types or sizes shall be furnished, having as nearly as practicable the same function, operation and quality as the specified hardware.
- H. Bolts, screws and other fastenings required for the application of the finished hardware shall be of size and type to fit requirements and shall be of the same material and finish as the exposed parts of such hardware which they adjoin. Exposed screws and bolts shall have countersunk oval heads and bolts shall be provided with cap nuts. Countersunk part of screw and bolt holes shall be finished smoothly without sharp edges and form a firm seal for such screw and bolt heads. Full threaded wood screws shall be furnished for all wood applications. No thru bolts will be allowed.

2.2 PRODUCTS AND MANUFACTURERS

- A. As scheduled.

2.3 SPECIFIC ITEMS

A. Hinges

1. Minimum of three (3) hinges per door leaf up to 7'-6" high. Provide one additional hinge per 2'-6" or fraction thereof.
2. Hinges shall be of types, sizes and materials as required to suit door weights thicknesses and fire ratings.
3. Hinge sizes shall be detailed so that the least amount of projection shall be visible from the frame.
4. Unless otherwise specified hinges shall have concealed ball-bearings (combination anti-friction or oil impregnated) and three (3) knuckles.
 - a. Standard doors shall have non-rising pins.
 - b. Doors exposed to the public, and other secure areas, as determined by the Owner, shall have non-removable pins.
5. Electric Hinges: Coordinate voltage and other electrical requirements with applicable portions of Division 26, Electrical.

B. Pivots

1. Provide quantities and types of pivots (offset, intermediate and center) as required to suit door sizes and weights.
2. Pivot sets (offset and center) shall consist of top and bottom pivots, unless otherwise indicated.
3. Provide a top pivot for each floor closer unless otherwise indicated.

C. Closers

1. Unless otherwise indicated, closers shall not be visible on the public side of doors. Closers opening into public spaces shall be provided with parallel arms and brackets to suit.
2. Closers shall be sized in accordance with the accepted manufacturer's standards to suit height, width, weight of door and draft conditions.
3. Provide a top pivot for each floor closer.
4. Provide weather sealing compound for each exterior floor closer.

D. Locking and Latching Devices

1. Mechanical: Provide types, functions, as specified. Coordinate with Owners keying requirements.
2. Electric Lock: Electric locks shall be fail safe and shall be deactivated by fire suppression system and devices (local and/or remote) as determined by the Owner.
 - a. Coordinate voltage and other electrical requirements with applicable portions of Division 26, Electrical.
3. Electric Strike: Electric locks shall be fail safe and shall be deactivated by fire suppression system and devices (local and/or remote) as determined by the Owner.
 - a. Coordinate voltage and other electrical requirements with applicable portions of Division 26, Electrical.

E. Keys and Keying

1. Coordinate new keying requirements with requirements of building standard keying system.
2. Provide three (3) keys for each differently keyed lock. Unless otherwise indicated, locks shall be keyed differently.
 - a. Locks to the following spaces shall be keyed alike:
 - 1). Mechanical Equipment Rooms, Electrical Panel Rooms, and Telephone Equipment Rooms.
 - 2). Janitor's Closets.
3. Provide one hundred (100) key blanks.
4. Provide three (3) Master Keys.
5. Provide key control system, including key cabinet with capacity to store 150% of keys furnished.
6. Final keying requirements will be determined by the Owner.

F. Stops: Provide stops to limit the degree of opening, helping to prevent damage to adjacent walls, columns, equipment, the door or its hardware.

1. Overhead Stops
 - a. Size overhead stops to suit door width, height, weight and draft condition.
 - b. Overhead stops shall have extruded architectural bronze tracks with a built-in shock absorber. The arm shall be hard-drawn brass.
2. Floor Stops: All stops to be fastened to concrete shall use expansion shields and machine screws.

- G. Pushes and Pulls: Provide concealed fasteners where practical. Where exposed fasteners are required provide flush type finished to match push or pull.
- H. Flush Bolts: Provide top and bottom extension type flush bolts, mounted twelve (12) inches and seventy-two (72) inches respectively from the bottom of each door, where scheduled. Provide each bottom flush bolt with a dustproof strike.
- I. Silencers: Provide silencers for all non-gasketed and non-weatherstripped frames. Provide three (3) for each single swing door and two (2) for each pair of doors.

2.4 FINISHES

- A. Provide finish hardware with the following finishes unless otherwise shown:

- 1. Hinges: US26D or US32D.
- 2. Pivots: US26D or US32D.
- 3. Surface Closers: US26D or US32D.
- 4. Floor Closers: US26D or US32D.
- 5. Locksets and Exit Devices: US26D or US32D.
- 6. Stops: US26D or US32D.
- 7. Pushes, Pulls, Kick Plates: US26D or US32D.
- 8. Flush Bolts: US26D or US32D.

PART 3 EXECUTION

3.1 GENERAL

- A. Make periodic checks during construction in order to ascertain that the finish hardware furnished has been installed correctly. After completion of all construction work, adjust finish hardware to work properly; test all keys and adjust as required for smooth, free operation.

3.2 HARDWARE SETS

- A. See attached schedule.

END OF SECTION

DOOR HARDWARE SCHEDULE

HARDWARE SET A Doors 123, 125

Lock: Schlage lock L9453P with RHO (L-Series 06) lever both sides, 619 finish, strike 10-072

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Threshold: National Guard Product Inc. model

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET B

Lock: Schlage lock L9070P with RHO (L-Series 06) lever both sides, 619 finish, strike 10-072

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET D Doors 108,118,119,120,121,207,208,213

Lock: Schlage lock L9010P with RHO (L-Series 06) lever both sides, 619 finish, strike 10-072

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET E Doors 116,117,206,211

Lock: Schlage lock L9070P with RHO (L-Series 06) lever both sides, 619 finish, strike 10-072

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Threshold: National Guard Product Inc. approved for ADA compliance

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET F Doors 130, 212

Lock: Schlage lock L9040P with RHO (L-Series 06) lever both sides, 619 finish, strike 10-072

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET G

Panic Hardware: Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS)

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Threshold: National Guard Product Inc. approved for ADA compliance

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

HARDWARE SET H

Lock: KABA Ilco Model 1021B-26-d-41, with lever handles on both sides, satin chrome finish

Closer: Jackson 20-330 Overhead Closer with HD spring size

Threshold: National Guard Product Inc. approved for ADA compliance

Hinges: Center line pivot by Jackson to be compatible with Jackson 20-330 overhead closer.

HARDWARE SET J

Panic Hardware: Advantex 30 Series mortise lock exit device by Detex in 630 finish (brushed SS)

30 Series exterior trim with S Lever in 630 finish

Closer: Yale(PA) 4400 with a Low Profile pull side track in a 689 (aluminum) finish

Threshold: National Guard Product Inc. approved for ADA compliance

Hinges: Stanley Hardware FBB191 5x4 Full Mortise Hinges, Finish US32D 1 1/2 pair hinges.

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SECTION 087300

AUTOMATIC DOOR OPERATORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Jackshaft-type door operators for high or vertical lift sectional doors and limited rolling door and grille applications.

1.2 RELATED SECTIONS

- A. Section 06100 – Rough Carpentry: Installation and requirements for blocking and nailers.
- B. Section 16050 – Basic Electrical Materials and Methods: Installation and requirements for electrical connections.

1.3 REFERENCES

- A. National Electrical Manufacturers Association (NEMA): NEMA ICS 6 - Industrial Control and Systems: Enclosures.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation Methods.
 - 4. Cleaning Methods.
- C. Shop Drawings: Submit Shop drawings showing layout, profiles, and product components, including anchorage, edge conditions, and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Schedule delivery of door operator so that spaces are sufficiently complete that door operators can be installed immediately upon delivery.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 WARRANTY

- A. Manufacturer's standard limited lifetime warranty against material and manufacturing defects.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: The Chamberlain Group, Inc.; 845 Larch Avenue, Elmhurst, IL 60126-1196. ASD. Tel: (800) 282-6225. Fax: (630) 516-8412. Email: www.chamberlain.com

or approved equal.

2.2 JACKSHAFT OPERATED DOOR OPERATOR

- A. Industrial-Duty Operator: Continuous-duty high-starting torque motor capable of driving the door at a speed of door speed of approximately 8 inches (203 mm) to 9 inches (229 mm) per second; Model J; Chamberlain, Elmhurst, IL.
 - 1. Electric Operator: Model J industrial-duty assembly, complete with electric motor and factory-prewired motor controls, positive locking mechanical brake, emergency disconnect, 3-button OPEN/CLOSE/STOP control station, conduit and wiring from control to motor, and accessories required for proper operation;
 - a. Electric Motor: Protected against overload by a current sensing or thermal overload device.
 - 1) Motor Specification (choose one):

208/230V-60Hz-3 Phase; ¾ HP
 - b. Primary Speed Reduction Device: Heavy-duty 4L V-belt with chain and sprocket double reduced secondary with mechanical braking to hold door in any position. Operator shall be equipped with adjustable friction clutch, floor level disconnect, and door driven sprocket.
 - c. Limit Switches: Fully adjustable, driven linear-type switch mechanism synchronizing operator with door. Low-friction nylon limit nuts shall be fitted on threaded steel shaft, rotating on oil-tight self-lubricating bronze bushings. Motor shall be removable without affecting limit switch settings.
 - d. Motor Control and Enclosure :
 - 1) Contactor-style (Mechanical) Motor Starter, Control, and Enclosure: Motor starter shall be an across-the-line, mechanically interlocked, magnetic-reversing contactor. Motor starting device shall be enclosed in a NEMA 1 enclosure and integral with the operator. Motor control device shall be enclosed in NEMA 1 enclosure and shall be integral with operator. Control enclosures shall conform to ANSI/NEMA ICS 6. Control enclosures shall conform to ANSI/NEMA ICS6. For 115V (1/2 through 1 HP), 208-230V (1/2 through 2 HP), 460V and 575V (1/2 through 1 HP).

- 2) Solid-State Motor Control and Enclosure: LiftMaster LOGIC 3 motor control shall be UL approved microprocessor solid-state type, and include the capability to select one of seven wiring types and a maximum run timer for motor protection. Additional features shall include a maintenance alert diagnostic system, timer-to-close w/timer defeat input, and mid-stop programming capabilities. Motor control device shall be enclosed in a NEMA 1 enclosure and integral with the operator. Control enclosures shall conform to ANSI/NEMA ICS6.
 - (a) Radio Receiver: LiftMaster LOGIC 3 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ Rolling Code Technology remote transmitters and Trinary Dip Switch remote transmitters, with memory for up to 23 Security+ remote transmitters or an unlimited number of Trinary Dip Switch remote transmitters.
- e. 3-Button Control Station: 3-button station providing OPEN/CLOSE/STOP shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
- f. Door Drive: Full #50 roller chain
2. Optional Operator Accessories:
 - a. Self-Monitoring Safety Operation Application: CPS-LN4 Self-Monitoring Sensor.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the Methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

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SECTION 088000

GLASS AND GLAZING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the glass and glazing as shown on the drawings and/or specified herein, including, but not limited to, glazing of the following:
 - 1. Windows.
 - 2. Doors.
 - 3. Curtain walls.
 - 4. Entrances.
 - 5. Storefront framing.
 - 6. Interior borrowed lites.
 - 7. Interior mirrors, frameless.

1.3 RELATED SECTIONS

- A. Hollow metal doors and frames - Section 081113.
- B. Aluminum entrances and storefronts Section 084113.
- C. Glazed curtain walls - Section 084413.
- D. Framed mirrors - Section 102800.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Glass Design: Glass thicknesses indicated on drawings and/or specified herein are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: 30 psf or greater if required by Code.
 2. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - a. Load Duration: 60 seconds or less.
 3. Maximum Lateral Deflection: For glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/100 times the short side length or 3/4", whichever is less.
 4. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - a. Temperature Change (Range): 120 deg. F ambient; 180 deg F, material surfaces.
- C. Glass units shall be annealed, heat strengthened, fully tempered or laminated where required to meet wind load and safety glazing requirements, as shown, specified, or recommended by the glass fabricator, and as required by the prevailing Building Code.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.
- B. Initial Selection Samples: Submit samples of each glass and glazing material showing complete range of colors, textures, and finishes available for each material used.
1. Submit complete range of samples of standard colors and patterns for ceramic frits at insulating glass.
 2. Submit complete range of samples of sandblasted glass showing variations of grits and opacity achieved.
- C. Verification Samples: Submit representative samples of each glass and glazing material that is to be exposed in completed work. Show full color ranges and finish variations

expected. Provide glass samples having minimum size of 144 sq. in. and 6 in. long samples of sealants and glazing materials; all samples shall bear the name of the manufacturer, brand name, thickness, and quality.

- D. Calculations: Provide wind load charts, calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied.
- E. Test Reports: Provide certified reports for specified tests.
- F. Warranties: Provide written warranties as specified herein.

1.6 QUALITY ASSURANCE

- A. Source: For each glass and glazing type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- B. Installer: A firm with a minimum of five years' experience in type of work required by this Section and which is acceptable to manufacturers of primary materials; and with a successful record of in-service installations similar in size and scope to this Project.
- C. Glass Thickness: Glass thicknesses shown on drawings and/or specified herein are minimum thicknesses. Determine and provide size and thickness of glass products that are certified to meet or exceed performance requirements specified in this Section. Provide units with proper thickness, edge clearance and tolerance to comply with recommendations of glass manufacturer.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
 - 1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
 - 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines for Sealed Insulating Glass Units."
- E. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
- F. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council.
 - 2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9

sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

- G. Insulating Glass Certification Program: Permanently marked on spacers with appropriate certification label of the following testing and inspecting agency:
1. Insulating Glass Certification Council.
 2. Associated Laboratories, Inc.

1.7 TESTS

- A. Preconstruction Sealant Test: Submit samples of materials to be used to glazing sealant manufacturer to determine sealant compatibility. Include samples of glass, gaskets, glazing materials, framing members, and other components and accessories of glazing work. Test in accordance with ASTM C 794 to verify what type of primers (if any) are required to ensure sealant adhesion to substrates.
1. Submit minimum of nine pieces of each type and finish of framing member, and nine pieces of each type, class, kind, condition, and form of glass, including monolithic, laminated, and insulating glass for adhesion tests.
 2. Provide manufacturer's written report and recommendations regarding proper installation.

1.8 PROJECT CONDITIONS

- A. Weather: Perform work of this Section only when existing or forecasted weather conditions are within limits established by manufacturers of materials and products used.
- B. Temperature Limits: Install sealants only when temperatures are within limits recommended by sealant manufacturer, except, never install sealants when temperatures are below 40 deg. F.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations and GANA Manual.
1. Protect materials from moisture, sunlight, excess heat, sparks and flame.
 2. Sequence deliveries to avoid delays, but minimize on-site storage.

1.10 WARRANTIES

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

- B. Manufacturer's Special Project Warranty on Coated Glass Products: Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects. Manufacturing defects are defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.
1. Warranty Period: Manufacturer's standard but not less than five (5) years after date of substantial completion.
- C. Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.
1. Warranty Period: Manufacturer's standard but not less than ten (10) years after date of substantial completion.
- D. Manufacturer's Special Project Warranty on Laminated Glass: Manufacturer's standard form, made out to Owner and signed by laminated glass manufacturer agreeing to replace laminated glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty period five (5) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/FABRICATORS

- A. All glass and glazing used at the exterior of the Project shall be manufactured by the same manufacturer. The same manufacturer and the same furnace shall be used for all tempered and heat strengthened glass used throughout the project.

2.2 GLASS MATERIALS AND PRODUCTS

- A. Clear Float Glass: ASTM C 1036, Type I (Transparent), Flat, Class 1 (Clear), Quality q3, minimum 1/4" thick.
- B. Clear Tempered Glass: ASTM C 1048, Condition A (Uncoated), Type I (Transparent), Flat, Class 1 (Clear), Quality q3, Kind FT, minimum 1/4" thick.
- C. Low 'E' Coated Glass: Provide high-performance, clear, metallic coating, Solarscreen VRE1-59, as manufactured by Viracon. Provide Low 'E' coating which has the

following performance characteristics when applied to the No. 2 surface of 1 in. insulating units, both lites 1/4" clear:

1. Visible Light Transmittance: 53%.
 2. Shading Coefficient: 0.39.
 3. Solar Energy Transmittance: 30%.
- D. Laminated Safety Glass: Provide two glass panes of equal thickness, laminated together with a polyvinyl butyl interlayer, conforming to ASTM C 1172 and as follows:
1. Interlayer Color: Clear.
 2. Interlayer Material: Provide Monsanto "Saflex" or DuPont "Butacite," 0.030 in. thick at vertical applications, and 0.060 in. thick at sloped or horizontal applications.
 3. Minimum thickness of 1/4".
- E. Patterned Glass: Provide ceramic frit patterned glass in custom colors and patterns as selected by the Architect, minimum thickness of 1/4".
- F. Insulating Glass: Provide factory assembled units of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space, complying with ASTM E 774-97, and as follows:
1. Sealing System: Dual Seal.
 2. Primary Sealant: Polyisobutylene.
 3. Secondary Sealant: Silicone, General Electric IGS 3204 or IGS 3100, Rhodorsil Rhodotherm 542 or 543, or Dow Corning 982.
 4. Sealant Color: Gray (for units and glazing)
 5. Spacer: Clear finish aluminum with welded, soldered, or bent corners.
 6. Desiccant: Molecular sieve, silica gel, or blend of both.
 7. Air Space Thickness: 1/2".
 8. Glass Thickness: 1/4" minimum.
- G. Laminated Glass with Intumescent Interlayers: Proprietary Category II safety glazing product in the form of multiple lites of Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Kind FT (fully tempered) float glass laminated with intumescent interlayers; and as follows:
1. Fire Protection Rating: As required by Code for the fire rated opening in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.

2. Product: "Pyrostop" by Pilkington Building Products North America and distributed by Technical Glass Products.
- H. Frameless Mirrors: 1/4", Quality q2, clear float glass with silver, copper, and organic coating, and as follows:

1. Edges: Uniformly ground and polished.

2.3 GLAZING MATERIALS AND PRODUCTS

- A. General: Provide sealants and gaskets with performance characteristics suitable for applications indicated. Ensure compatibility of glazing sealants with insulating glass sealants, with laminated glass interlayers, and with any other surfaces in contact.
- B. General Glazing and Cap Bead Sealant: Provide sealant with maximum Shore A hardness of 50. Provide one of the following:
1. Dow Corning 795.
 2. General Electric Silglaze N 2500 or Contractors SCS-1000.
 3. Rhodorsil 3B, 5C, or 6B.
 4. Tremco Spectrem 2.
- C. Weather Seal Sealant: Provide non-acid curing sealant with movement range $\pm 50\%$, ASTM C 719. Provide one of the following:
1. Dow Corning 795.
 2. General Electric Silpruf.
 3. Rhodorsil 3B, 5C, or 6B.
 4. Tremco Spectrem 2.
- D. Dense Elastomeric Compression Seal Gaskets: Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of 75 ± 5 for hollow profile, and 60 ± 5 for solid profiles, ASTM C 864.
- E. Cellular, Elastomeric Preformed Gaskets: Provide extruded or molded closed cell, integral-skinned neoprene, Shore A 40 ± 5 , and 20% to 35% compression, ASTM C 509; Type II.
- F. Preformed Glazing Tape: Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with ASTM C 1281 AAMA A 800 with integral continuous EPDM shim. Provide preformed glazing tape in extruded tape form. Provide Tremco "Polyshim II" or approved equal.
- G. Setting Blocks: Provide neoprene or silicone blocks with Shore A hardness of 80-90. Provide products certified by manufacturer to be compatible with silicone sealants. Length to be not less than 4". Width for setting blocks to be 1/16" more than glass thickness and high enough to provide the lite recommended by glass manufacturer.

When thickness of setting block exceeds 3/4" the glass manufacturer must be consulted for sizes and configuration. In a vented system, setting block shall be designed so as to not restrict the flow of water within the glazing rabbet to the weep holes.

1. Shims: For shims used with setting blocks, provide same materials, hardness, length and width as setting blocks.
 2. Structural Silicone Glazing: Provide silicone setting blocks where structural silicone occurs at sills and at insulating units with silicone edge seals.
- H. Edge Blocks: Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of 55 ± 5 .
- I. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place.
- J. Miscellaneous Glazing Materials: Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.
- K. Mirror Adhesive: Palmer's Super Set Mirro-Mastic.
1. Clips: No. 4 finish Type 304 stainless steel.

2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep system.
 3. Minimum required face or edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Shop Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

- L. Flush Glazing

1. If the butt joint in the metal framing is in the vertical direction, the glazier shall run the tape initially on the head and sill members going directly over this joint. Should the butt joint in the metal framing run horizontally, tapes must first be applied to the jambs so that it crosses over the joint.
2. Each tape section shall butt the adjoining tape and be united with a tool to eliminate any opening.
3. Do not overlap the adjoining length of tape or rubber shim as this will prevent full contact around the perimeter of glass.

- M. Off-Set Glazing

1. Where the glazing legs are off-set, the difference in the rabbet width shall be compensated by employing different glazing tapes with different diameter shims. The difference in shim shall be equal to the size of the off-set. The thinner tape shall be positioned first on the glazing leg closest to the interior. The thicker tape shall be cut to the exact length of the dimension between the applied tapes, and installed on the outermost glazing leg.
2. Immediately prior to setting glass, paper backing shall be removed. Apply a toe bead of sealant 6" in each direction, from each corner.
3. Locate setting blocks in the sill member at quarter points, or if necessary to within 6" of each corner. Setting blocks must be set equal distance from center line of the glass and high enough to provide the recommended bite and edge clearances.
4. Set edge block according to glass manufacturer's recommendations.
5. Set Glass: The glass shall be pressed firmly against the tape to achieve full contact.
6. In a vented system, apply a heel bead (air seal) of sealant around the perimeter of glass, between the sole of the I.G. unit and the base of the rabbet of the metal framing developing a positive bond to the unit and to the metal framing. The bead of the sealant shall be deep enough so that it will partially fill the channel to a depth of 1/4" between the glass edge and the base of the metal framing rabbet.
7. Interior stops shall be set, and glazing tape spline for the appropriate face clearance shall be rolled into place, compressing the glass to the shim within the glazing tape.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant as recommended by glass manufacturer or glass frame manufacturer.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape where noted on approved shop drawings.

3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 FRAMELESS MIRRORS

- A. Apply mastic to back of mirror "pats" spaced 4 pats/sq. ft.; adjust mirror so that it is plumb and in place to avoid distortion of reflecting images. Allow 1/8" space between back of mirror and wall surface.
 - 1. Apply "pats" using Palmer Electric Applicator.
- B. Apply stainless steel clips at mirror top and bottom; securely clip to substrate using non-corrosive anchors. At drywall, back-up anchors must be secured to studs or steel wallplate spanning from stud to stud.

3.8 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.

END OF SECTION

SECTION 089000

LOUVERS AND VENTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the louvers and vents as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Aluminum louvers.
 - 2. Blank off panels.
 - 3. Bird screens.

1.3 RELATED SECTIONS

- A. Masonry - Section 042000.
- B. Sealant work - Section 079200.
- C. Glazed aluminum curtain walls - Section 084413.
- D. Louvers connected to ductwork - Division 23.

1.4 QUALITY ASSURANCE

- A. Performance Requirements
 - 1. Structural Performance: Provide exterior metal louvers capable of withstanding the effects of loads and stresses from wind and normal thermal movement without evidencing permanent deformation of louver components including blades, frames, and supports; noise or metal fatigue caused by louver blade rattle or flutter or permanent damage to fasteners and anchors.
 - a. Wind Load: Uniform pressure (velocity pressure) of 30 lbf/sq. ft., acting inward or outward.
 - 2. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, and other detrimental effects.

- a. Temperature Change (Range): 120 deg. F., ambient; 180 deg. F, material surfaces.
- 3. Louver shall be rated for less than 0.15" pressure drop on intake and less than 0.3 ounces per square foot water penetration at 800 FPM free area velocity. Louver shall be rated by AMCA and bear their label.
- B. Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for fabrication, construction details and installation procedures, except as otherwise indicated.
- C. Field Measurements: Verify size, location and placement of louver units prior to fabrication.
- D. Shop Assembly: Coordinate field measurements and shop drawings with fabrication and shop assembly to minimize field adjustments, splicing, mechanical joints and field assembly of units. Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, certified test data, where applicable, and installation instructions for required products, including finishes.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of louver units and accessories. Include plans, elevations and details of sections and connections to adjoining work. Indicate materials, finishes, fasteners, joinery and other information to determine compliance with specified requirements.
- C. Samples: Submit six (6) inch square samples of each required finish. Prepare samples on metal of same gauge and alloy to be used in work. Where normal color and texture variations are to be expected, include two (2) or more units in each sample showing limits of such variations.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 LOUVER MATERIAL

- A. Provide storm resistant extruded aluminum louvers (ASTM B 221), of profiles shown on drawings, manufactured by Construction Specialties, Inc., or equal made by Airolite, Airline Products Co., or approved equal.

- B. Heads, sills, jambs and mullions to be one piece structural members of 6063-T52, alloy, 0.125" thick, with integral caulking slot and retaining beads. Blades to be minimum 0.081" thick. Closed cell PVC compression gaskets to be provided between bottom of mullion or jamb and top of sill to insure lead tight connections. Concealed structural supports to be designed by the louver manufacturer to carry a wind load of not less than forty (40) lbs. per square foot. All fasteners to be stainless steel.
- C. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- D. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Acid-chromate-fluoride-phosphate conversion coating; Organic Coating: As specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.
 - 1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605-98.
 - 2. Color: 3HR762691 Truform H/G Red Paint by PPG Industries.
- E. Louvers shall be furnished with 1/2" mesh, 0.063 diameter aluminum wire intercrimp bird screen secured in removable extruded aluminum frames.
- F. Provide aluminum blank off panels behind louvers where shown on mechanical drawings, fabricated from 1/8" thick aluminum face sheets, finish to match louvers; reinforce as required to form rigid assembly. Blank off panels shall be insulated with thermafiber insulation of thickness needed to insure an R value of eleven (11).
- G. Fastenings: Fasteners for exterior application shall be stainless steel. Provide types, gauges and lengths to suit unit installation conditions. Use Phillips flat head machine screws for exposed fasteners, unless otherwise indicated.
- H. Anchors and Inserts: Use non-ferrous metal or hot dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled in place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- I. Bituminous Paint: SSPC-Paint 12 (cold applied asphalt mastic).

2.2 FABRICATION, GENERAL

- A. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.
- B. Include supports, anchorages, and accessories required for complete assembly.
- C. Provide sill extensions made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.

- D. Join frame members to one another and to stationary louver blades by welding, except where indicated otherwise or where field bolted connections between frame members are necessary by size of louvers. Maintain equal blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where louvers and vents are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions and directions for the installation of anchorages which are to be embedded in masonry construction. Coordinate the delivery of such items to the project site.

3.3 INSTALLATION

- A. Locate and place louver units plumb, level and in proper alignment with adjacent work.
- B. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers, as indicated.
- D. Repair finishes damaged by cutting, welding, soldering and grinding operations required for fitting and jointing. Restore finishes and prime coats of paint so that there is no evidence of corrective work. Return items which cannot be refinished in the field to the shop, make the required alterations, and refinish the entire unit, or provide new units, at Contractor's option.
- E. Protect aluminum surfaces from corrosion by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry or dissimilar metals.
- F. Provide concealed gaskets, flashings, joint fillers and insulations, and install as the work progresses to make the installations weathertight.

3.4 LOUVER SCHEDULE

- A. Louver 1: Anodized aluminum louver, size and location as indicated on the Drawings.
- B. Louver 2: Painted aluminum louver, size and location as indicated on the Drawings.

END OF SECTION

SECTION 089119**EXTRUDED ALUMINUM STATIONARY LOUVERS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Extruded aluminum stationary louvers with drainable blades.

PART 2 PRODUCTS**2.1 MANUFACTURER**

- A. Ruskin Manufacturing, 3900 Dr. Greaves Road, Kansas City, Missouri 64030. Phone (816) 761-7476. Fax (816) 765-8955 or approved equal.

2.2 LOW LEAKAGE CONTROL DAMPER

The CD60 is a low leak, galvanized steel damper designed with airfoil blades for higher velocity and pressure HVAC systems. It meets the leakage requirements of the International Energy Conservation Code by leaking less than 3 cfm/sq. ft. at 1" of static pressure and is AMCA licensed as a Class 1A damper.

- A. Fabrication
1. Model: CD60 Low Leakage Control Damper, or equivalent.
 2. Frame: 5" x 1" x 16 gage (127 x 25 x 1.6) galvanized steel hat channel reinforced with corner braces for structural strength equal to 11gage (3.05) channel frames. Low profile 3 1/2" x 3/8" x 16 gage (89 x 10 x 1.6) galvanized steel channel top and bottom frame on dampers under 12" (305) high.
 3. Blades: *Galvanized steel airfoil shaped double skin construction of 14 gage (2.0) equivalent thickness, 6" (152) wide. Parallel or opposed action.*
 4. Seals: Ruskiprene, or equivalent blade edge seals and flexible metal compressible jamb seals.
 5. Bearings: Stainless steel sleeve.
 6. Linkage: Concealed in frame.
 7. Axles: 1/2" (13) plated steel hex. Removable control shaft extends 6" (152) beyond frame.
- B. Performance Data:
1. Maximum Size: Single section – 60"w x 72"h (1524 x 1829). Multiple section assembly – Unlimited size.
 2. Minimum Size: Single blade – 8"w x 6"h (203 x 152). Two blades, parallel or opposed action: 8"w x 11"h (203 x 279).
 3. Temperature Limits: -72°F (-60°C) minimum and +275°F (+135°C) maximum.

4. Torque Requirements: 7 in. lbs./sq. ft. Torque value is for system pressures below 2 1/2" w.g. For higher pressures, consult Manufacturer. Minimum torque requirement is 20 in. lbs.

2.3 ACCESSORIES

2.3 FACTORY FINISH

- A. Finish shall be as selected by the Architect.

PART 3 EXECUTION

3.1 EXAMINATION

Furnish and install, at locations shown on plans, or in accordance with schedules, control dampers that meet the following minimum construction standards. Frame shall be 16 gage (1.6) galvanized steel structural hat channel with tabbed corners for reinforcement for 11 gage (3.05) structural equivalence. Blades shall be 14 gage (2.0) equivalent thickness galvanized steel, roll-formed airfoil type for low pressure drop and low noise generation. Blade edge seals shall be Ruskiprene type or equivalent suitable for -72°F (-60°C) to +275°F (+135°C) mechanically locked into the blade edge. Adhesive or clip-on type seals are unacceptable. Jamb seals shall be flexible metal, compression type to prevent leakage between blade end and damper frame. Blade end overlapping frame is unacceptable. Bearings shall be corrosion resistant, permanently lubricated stainless steel sleeve type turning in an extruded hole in the damper frame. Axles shall be hexagonal positively locked into the damper blade. Linkage shall be concealed out of airstream, within the damper frame to reduce pressure drop and noise. Submittal must include leakage, maximum air flow and maximum pressure ratings based on AMCA Publication 500. Damper shall meet the leakage requirements of the International Energy Conservation Code by leaking less than 3 cfm/sq. ft. at 1" of static pressure and shall be AMCA licensed as a class 1A damper. Dampers shall be Ruskin CD60 model.

SP100: Dampers shall be equipped with factory installed damper position indication switch package. The switch package shall include two position indication switches linked directly to the damper blade to provide full open and full closed damper blade position. The switch package shall be capable of interfacing with the HVAC control system and provide remote damper blade position status. Switch package shall be Ruskin Model SP-100.

Factory Mounted Damper Actuators: Control damper actuators are required. They shall be furnished and mounted by the damper manufacturer in their factory. Each damper shall be cycle tested at the factory prior to shipment.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Ruskin Manufacturing, 3900 Dr. Greaves Road, Kansas City, Missouri 64030. Phone (816) 761-7476. Fax (816) 765-8955 or approved equal.

2.2 EXTRUDED ALUMINUM STATIONARY LOUVERS

- A. Fabrication:
1. Model: ELF375DX.
 2. Performance Ratings: AMCA licensed.
 3. Frame:
 - a. Material: Extruded aluminum, Alloy 6063-T5.
 - b. Wall Thickness: 0.081 inch (2.1 mm), nominal.
 - c. Depth: 4 inches (102 mm).
 - d. Downspouts and caulking surfaces.
 4. Blades:
 - a. Style: Drainable.
 - b. Material: Extruded aluminum, Alloy 6063-T5.
 - c. Wall Thickness: 0.081 inch (2.1 mm), nominal.
 - d. Angle: 37.5 degrees.
 - e. Centers: 5-3/32 inches (129 mm), nominal.
 5. Bird Screen:
 - a. Material: Aluminum, [3/4 inch x 0.051 inch (19 mm x 1.3 mm), expanded, flattened] [1/2 inch mesh x 0.063 inch (13 mm mesh x 1.6 mm), intercrimp].
 - b. Frame: Removable, rewireable.
 6. Gutters: Drain gutter in head frame and each blade.
 7. Downspouts: Downspouts in jambs to drain water from louver for minimum water cascade from blade to blade.
 8. Vertical Supports: Hidden vertical supports to allow continuous line appearance up to 120 inches (3,048 mm).
 9. Sill: Steeply angled integral sill eliminating areas of standing or trapped moisture where mold or mildew may thrive and effect indoor air quality.
 10. Assembly: Factory assemble louver components. All welded construction.
- B. Performance Data:
1. Based on testing 48 inch x 48 inch (1,219 mm x 1,219 mm) size unit in accordance with AMCA 500.
 2. Free Area: 54 percent, nominal.
 3. Free Area Size: 8.58 square feet (0.80 m²).
 4. Maximum Recommended Air Flow Thru Free Area: 873 feet per minute (266 m/min).
 5. Air Flow: 7,490 cubic feet per minute (212 m³/min).
 6. Maximum Pressure Drop: 0.15 inches w.g. (0.04 kPa).
 7. Water Penetration: Maximum of 0.01 ounces per square foot (3.1 g/m²) of free area at an air flow of 873 feet per minute (266 m/min) free area velocity when tested for 15 minutes.

2.3 ACCESSORIES

- A. Blank-Off Panels: [0.040 inch (1 mm) aluminum sheet] [1 inch (25 mm), aluminum skin, insulated core], factory installed with removable screws and neoprene gaskets.
- B. Insect Screens.

2.4 FACTORY FINISH

- A. Finish shall be as selected by the Architect.
- B. Color for Fluoropolymer Coating: Color as selected by Architect from manufacturer's standard colors.
- C. Color for Anodize Finish: [Black] [Clear Anodize] [Dark Bronze] [Medium Bronze].

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect areas to receive louvers. Notify the Architect of conditions that would adversely affect the installation or subsequent utilization of the louvers. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install louvers at locations indicated on the drawings and in accordance with manufacturer's instructions.
- B. Install louvers plumb, level, in plane of wall, and in alignment with adjacent work.
- C. Install joint sealants as specified in Section 079200.
- D. Apply field topcoat within 6 months of application of shop prime coat. Apply field topcoat as specified in Section 099000.

3.3 CLEANING

- A. Clean louver surfaces in accordance with manufacturer's instructions.
- B. Repair minor damaged surfaces as directed by Architect.

END OF SECTION

SECTION 092116

GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum board shaft-wall assemblies for mechanical shafts.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Georgia Pacific, National Gypsum Co., Lafarge North America, United States Gypsum Company, or approved equal.
- B. Cavity Shaft Wall Assemblies:
 - 1 Shaft Wall Board Thickness: Not less than 1 inch.
 - 2 Studs: I, C-H or double E studs, not less than 20 gauge (.0329 inch).
- C. Gypsum Board Shaft Wall Materials:
 - 1 Steel Framing: ASTM C 645 [ASTM A 653, G40, hot-dip galvanized] [Manufacturer's standard corrosion-resistant zinc] coating.
 - 2 Gypsum Shaft Wall Board: ASTM C 442, Type X.
- D. Auxiliary Materials:
 - 1 Cornerbeads, edge trim, and control joints.
 - 2 Laminating adhesive.
 - 3 Gypsum board screws, ASTM C 1002.
 - 4 Concealed acoustical sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with shaft wall manufacturer's recommendations, ASTM C 840 and GA 216 Recommended Specifications for the Application and Finishing of Gypsum Board.

- B. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
- C. Install trim and 3-coat joint treatment in strict compliance with manufacturer's instructions and recommendations. Joint treatment is required at all fasteners and edges between boards. Fill all surface defects. Sand between and after joint treatment coatings and leave ready for finish painting or wall treatment.

END OF SECTION

SECTION 092900

GYPSUM DRYWALL

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the gypsum drywall as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Gypsum board work for interior partitions, ceilings, column enclosures, furring, and elsewhere where gypsum drywall work is shown on drawings.
 - 2. Gypsum board work for exterior ceilings and soffits.
 - 3. Metal supports for gypsum drywall construction.
 - 4. Acoustical insulation for gypsum drywall work.
 - 5. Sealant for gypsum drywall work.
 - 6. Concealed metal reinforcing for attachment of railings, toilet partitions and other items supported on drywall partitions and walls.
 - 7. Taping and finishing of drywall joints.
 - 8. Installing rings and frames in drywall surfaces for grilles, registers and lighting fixtures.
 - 9. Gypsum shaftwall construction.
 - 10. Bracing and connections.

1.3 RELATED SECTIONS

- A. Thermal Insulation - Section 072100.
- B. Hollow metal door frames - Section 081113.
- C. Access doors - Section 083113.
- D. Painting - Section 099000.
- E. Rings for grilles, registers and light fixtures - Division 23 and 26.

1.4 QUALITY ASSURANCE

- A. The following standards as well as other standards which may be referred to in this Section, shall apply as applicable to the work of this Section:
1. Gypsum Drywall Construction Handbook, latest edition, U.S. Gypsum Co.
 2. ASTM C 645 "Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels For Screw Application of Gypsum Board."
 3. ASTM A 568 "Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For."
 4. ASTM C 1396 "Standard Specification for Gypsum Board."
 5. ASTM C 475 "Standard Specification for Joint Treatment Materials For Gypsum Wallboard Construction."
 6. ASTM C 840 "Standard Specification for Application and Finishing of Gypsum Board."
 7. ASTM C 919 "Standard Specification for Use of Sealants in Acoustical Applications."
 8. ASTM C 954 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 in. to 0.112 in. in Thickness."
 9. ASTM C 1002 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board."
 10. ASTM C 754 "Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Board."
 11. ASTM D 3273 "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber."
 12. ASTM C 1177 "Specification for Glass Mat Gypsum Substrate for Use at Sheathing."
 13. ASTM C 1178 "Specification for Glass Mat Water Resistant Gypsum Backing Board."
 14. ASTM C 1278 "Specification for Fiber Reinforced Gypsum Panels."
- B. Allowable Tolerances: 1/32" offsets between planes of board faces, and 1/16" in 8'-0" for plumb, level, warp and bow.
- C. System Design Load: Provide standard drywall assemblies designed and tested by manufacturer to withstand a lateral load of 5 lbs. per sq. ft. for the maximum wall height required, and with deflection limited to 1/240 of partition height.

1. Drywall assemblies with tile finish shall have a deflection limit of 1/360.
- D. Fire-Resistance Rating: Where gypsum drywall with fire resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction, and compliant with UL Test #2079; criteria for cycle movement for all field height wall sections requiring allowance for vertical deflection within framing details.
- E. Installer: Firm with not less than 5 years of successful experience in the installation of specified materials.
- F. For projects located in New York City, comply with New York City Section 32-05 of Chapter 32 of Title 1 of the Official Compilation of the Rules of the City of New York regarding "Impact Resistant Stair and Elevator Enclosures" when such enclosures are of gypsum drywall construction.

1.5 INDOOR AIR QUALITY MANAGEMENT PLAN

- A. The following practices shall be implemented in accordance with the Construction Indoor Air Quality Management Plan.
 1. Gypsum wallboard is to be stored per manufacturer's recommendations for allowable temperature and humidity range. Products shall not be allowed to become damp.
 2. Where feasible, gypsum wallboard shall be stored separately from materials which have high short-term emissions. Materials with high short-term emissions include, but are not limited to, adhesives, sealants, and glazing compounds (specifically those with petrochemical vehicles or carriers); paint, wood preservatives, and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.
 3. Where feasible, exposed fiberglass or mineral wool insulations shall not be stored in occupied spaces, near HVAC diffusers (supply or return), or near fresh air intakes.

1.6 SUBMITTALS

- A. Submit shop drawing for each drywall partition, furring and ceiling system showing size and gauges of framing members, hanger and anchorage devices, wallboard types, insulation, sealant, methods of assembly and fastening, control joints indicating column lines, corner details, joint finishing and relationship of drywall work to adjacent work.
- B. Samples: Each material specified herein, 12" x 12", or 12" long, or in manufacturer's container, as applicable for type of material submitted.
- C. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition, furring and ceiling system specified herein, and for each fire-rated

and sound-rated gypsum board assembly. Submit other data as required to show compliance with these specifications.

- D. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

1.7 PRODUCT HANDLING AND PROTECTION

- A. Deliver, store and handle drywall work materials to prevent damage. Deliver materials in their original, unopened containers or bundles, and store where protected from moisture, damage and from exposure to the elements. Store wallboard in flat stacks.
- B. Protect wallboard from becoming wet.

1.8 ENVIRONMENTAL CONDITIONS

- A. Provide and maintain minimum temperature of fifty-five (55) degrees F. and adequate ventilation to eliminate excessive moisture within the building in the area of the drywall work for at least twenty-four (24) hours, prior to, during and after installation of drywall work. Installation shall not start until windows are glazed and doors are installed, unless openings are temporarily closed. Space above suspended ceilings shall be vented sufficiently to prevent temperature and pressure build up.

1.9 JOB MOCK-UP

- A. At a suitable location, where directed by the Architect, lay up a portion of a finished wall and ceiling demonstrating the quality of work, including finishing, to be obtained under this Section. Omit drywall boards in locations as directed by the Architect to show stud spacing and attachments; after acceptance, complete assembly.
- B. Adjust the finishing techniques as required to achieve the finish required by the Architect as described in this Section of these specifications.
- C. Upon approval of the mock-up, the mock-up may be left in place as a portion of the finished work of this Section.
- D. All drywall work shall be equal in quality to approved mock-up.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Materials specified below, unless noted otherwise or specified herein, are those of U.S. Gypsum Co. Equivalent materials of National Gypsum Co., Georgia Pacific and Lafarge meeting specification requirements are acceptable.

2.2 METAL SUPPORTS

- A. Metal Floor and Ceiling Runners

1. Channel Type: Formed from 20 U.S. Std. gauge (unless otherwise noted) galvanized steel, width to suit channel type metal studs. Use 20 ga. top runners with 1-1/4" minimum flanges.
2. Ceiling runners and head of wall connections at rated partitions shall conform to UL #2079 for cycle movement. Provide positive mechanical connection of framing to structure, allowing for vertical movement within connections. Minimum of 20 ga. galvanized steel for clips, 25 ga. galvanized steel for ceiling runners. Providing a friction free – anti-seizure movement capacity.
 - a. As manufactured by the Steel Network, VertiClip or VertiTrack.
 - b. FireTrak (including stud clips) by FireTrak Corp.
3. "J" Type: Formed from 20 U.S. Std. gauge galvanized steel, 1" x 2-1/2" or 4" wide (to suit detail) x 2-1/4" (for shaft wall).

B. Metal Studs, Framing and Furring

1. Channel Type Studs: Channel type with holes for passage of conduit formed from minimum 20 U.S. Std. gauge (unless heavier gauge is required to meet deflection limits) galvanized steel, width as shown on drawings.
2. Furring Channels: Hat shaped, formed from galvanized steel, 25 U.S. Std. gauge.
3. "C-H" Type Stud: 1-1/2" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
4. Double "E" Type Stud: 2" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
5. Continuous 16 gauge x 8" wide steel wall plate screwed to studs as required for support of railings, toilet partitions and other items supported on drywall partitions and walls.

C. Suspended Ceiling and Fascia Supports

1. Main Runners: 1-1/2" steel channels, cold rolled at 0.475 lbs. per ft., rust-inhibitive paint finish.
2. Furring Members: Screw-type hat-shaped furring channels of 25 ga. zinc-coated steel; comply with ASTM C 645.
3. Hangers: Galvanized, 1" x 3/16" flat steel slats capable of supporting 5x calculated load supported.
4. Hanger Anchorages: Provide inserts, clips, bolts, screws and other devices applicable to the required method of structural anchorage for ceiling hangers. Size devices for 5x calculated load supported.

5. Furring Anchorages: 16 ga. galvanized wire ties, manufacturer's standard clips, bolts or screws as recommended by furring manufacturer.

2.3 GYPSUM WALLBOARDS

- A. Gypsum Wall Board: 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- B. Fire Rated Gypsum Wall Board: 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock Firecode C," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- C. Water Resistant Backing Board for Tile Finish: 1/2" thick and 5/8" thick, 3' x 6', "Durock Tile Backer Board" or "Dens-Shield Tile Backer Board" by Georgia Pacific. Cover joints with a pressure sensitive woven glass fiber tape equal to Imperial Type P Tape.
- D. Water Resistant Gypsum Wall Board (for areas in toilet rooms, lockers, janitor's closets not scheduled to receive ceramic tile, or where fire rating is required): 1/2" thick and 5/8" thick as indicated on drawings, "Mold Tough" or "Mold Tough FR," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- E. Shaft Wall Liner: Solid gypsum board liner for shaft wall construction, 1" thick, 24" wide, as required to suit condition, by standard lengths as required, beveled edges. Provide "Mold Tough Liner Panel" or "DensGlass Ultra Shaft Guard" by Georgia Pacific.
- F. Exterior Gypsum Wall Board for Soffits: 5/8" thick "USG Exterior Gypsum Ceiling Board" or equal conforming to ASTM C 931.
- G. Mold Resistant Wall Board (at all perimeter walls and wet shafts): 1/2" and 5/8" thick as indicated on drawings, 48" wide "DensArmour Plus" by Georgia Pacific or "Mold Tough" by USG, or approved equal that has a rating of 10 per ASTM D 3273.
- H. Abuse Resistant Wallboard: 1/2" and 5/8" thick as indicated on drawings, "Fiberock Brand Panel VHI Abuse Resistant," 48" wide in maximum lengths available to minimize end-to-end butt joints.

2.4 ACCESSORIES

- A. Acoustic Insulation: Paper-less, non-combustible, semi-rigid mineral fiber mat, 2" thick, in walls (unless otherwise indicated), 3 lb./cu. ft. maximum density; Thermafiber LLC "Thermafiber," or approved equal.
- B. Fasteners for Wall Board: USG Brand Screws; Type S Bugle Head for fastening wallboard to lighter gauge interior metal framing (up to 20 ga.). Type S-12 Bugle Head for fastening wallboard to heavier gauge interior metal framing (20 ga. to 12 ga.); Type S and Type S-12 Pan Head for attaching metal studs to door frames and runners; and Type G Bugle Head for fastening wallboard to wall board. Lengths specified below under "Part 3 - Execution" Articles and as recommended by drywall manufacturer.
- C. Laminating Adhesive: "Sheetrock Brand Joint Compound."

- D. Metal Trim - Corner Beads: For 90 degree External Corners - "Dur-A-Bead" No. 103, 27 U.S. Std. ga. galvanized steel, 1-1/4" x 1-1/4", for 90 degree external corners.
- E. Metal Trim - Edge Beads: "Sheetrock Brand Paper Faced Metal Bead and Trim."
- F. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: Paper tape for joint reinforcing; Setting Type (Durabond 90) or Lightweight Setting Type Joint Compound for taping and topping; and Ready Mix Compound for finishing.
 - 1. For areas to receive mold-resistant drywall, use tape with compounds as recommended by manufacturer.
- G. Control Joints: No. 0.093, USG.
- H. Acoustical Sealant: USG "Acoustical Sealant" or "Tremco Acoustical Caulking" of Tremco Mfg. Co., or approved equal.
- I. Neoprene Gaskets: Conform to ASTM D 1056.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where gypsum drywall is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. General

- 1. Install drywall work in accordance with drywall manufacturer's printed instructions and as indicated on drawings and specified herein.
- 2. All metal framing for drywall partitions shall extend from floor to underside of structural deck above. Provide for vertical deflection with positive mechanical connections of framing members to structure.
- 3. Provide concealed reinforcement, 16 ga. thick by eight (8) inches wide or as detailed or as recommended by manufacturer, for attachment of railings, toilet partitions, and other items to be supported on the partitions which cannot be attached to the metal framing members. Concealed reinforcement shall span between metal studs and be attached thereto using two (2) self-tapping pan head screws at each stud.
 - a. Back of drywall shall be scored or notched to prevent bulging out where reinforcement plate occurs.

- B. Fire-Rated Assemblies: Install fire-rated assemblies in accordance with requirements of authorities having jurisdiction, Underwriters' Laboratories and test results obtained and published by the drywall manufacturer, for the fire-rated drywall assembly types indicated on the drawings.
- C. Acoustic Assemblies: Install acoustic rated assemblies to achieve a minimum STC as noted on drawings, in accordance with test results obtained and published by the drywall manufacturer, for the drywall assembly type indicated on the drawings.
- D. Sealant
 - 1. Install continuous acoustical sealant bead at top and bottom edges of wallboard where indicated or required for sound rating as wallboard is installed, and between metal trim edge beads and abutting construction.
 - 2. Install acoustical sealant in 1/8" wide vertical control joints within the length of the wall or partitions, and in all other joints, specified below under "Control Joints." Install bead of acoustical sealant around electric switch and outlet boxes, piping, ducts, and around any other penetration in the wallboard; place sealant bead between penetrations and edge of wallboard.
 - 3. Where sealant is exposed to view, protect adjacent surfaces from damage and from sealant material, and tool sealant flush with and in same plane as wallboard surface. Sealant beads shall be 1/4" to 3/8" diameter.
- E. Wall Board Application
 - 1. Do not install wallboard panels until steel door frames are in place; coordinate work with Section 081113 – Steel Doors and Frames.
 - 2. See drawings for all board types. Use fire-rated wallboard for fire-rated assemblies. Use water-resistant wallboard where indicated on drawings and where wallboard would be subject to moisture. Install water-resistant wallboard in full, large sheets (no scraps) to limit number of butt joints.
 - 3. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.
 - 4. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
 - 5. Provide "Thermafiber" safing insulation meeting standards of Section 078413 at flutes of metal deck where partitions carry up to bottom of metal deck.
 - 6. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard; fill gaps with acoustic sealant.
 - 7. Where wallboard is to be applied to curved surfaces, dampen wallboard on back side as required to obtain required curve. Finish surface shall present smooth, even curve without fluting or other imperfections.

8. Screw fasten wallboard with power-driven electric screw driver, screw heads to slightly depress surface of wallboard without cutting paper, screws not closer than 3/8" from ends and edges of wallboard.
9. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.

F. Cement Backer Board

1. General: Furnish concrete backer board in maximum available lengths. Install horizontally, with end joints over framing members.
2. Fastening: Secure concrete backer board to each framing member with screws spaced not more than 12 inches on center and not closer than 1/2" from the edge. Install screws with a conventional screw gun so that the screw heads are flush with the surface of the board.
3. Joint Treatment: Fill space between edge of backer and receptor with dry-set Portland cement or latex-Portland cement mortar. Fill all horizontal and vertical joints and corners with dry-set Portland cement or latex-Portland cement mortar. Apply fiberglass tape over joints and corners and embed with same mortar.

G. Metal Trim: Install and mechanically secure in accordance with manufacturer's instructions; and finish with three (3) coats of joint compound, feathered and finish sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions.

1. Corner Beads: Install specified corner beads in single lengths at all external corners, unless corner lengths exceed standard stock lengths.
2. Edge Beads: Install specified edge beads in single lengths at all terminating edges of wallboard exposed to view, where edges abut dissimilar materials, where edges would be exposed to view, and elsewhere where shown on drawings. Where indicated on drawings, seal joint between metal edge bead and adjoining surface with specified gasket, 1/8" wide minimum and set back 1/8" from face of wallboard, unless other size and profile indicated on drawings.
3. Casing beads shall be set in long lengths, neatly butted at joints. Provide casing beads at juncture of board and vertical surfaces and at exposed perimeters.

H. Control Joint Locations: Gypsum board surfaces shall be isolated with control joints where:

1. Ceiling abuts a structural element, dissimilar wall or other vertical penetration.
2. Construction changes within the plane of the partition or ceiling.
3. Shown on approved shop drawings.
4. Ceiling dimensions exceed thirty (30) feet in either direction.
5. Wings of "L," "U," and "T" shaped ceiling areas are joined.

6. Expansion or control joints occur in the structural elements of the building.
7. Shaftwall runs exceed 30' without interruption.
8. Partition or furring abuts a structural element or dissimilar wall or ceiling.
9. Partition or furring runs exceed 30' without interruption.
10. Where control joints are required, ceiling height door frames may be used as control joints. Less than ceiling height frames shall have control joints extending to the ceiling from both corners.

I. Joint Treatment and Spackling

1. Joints between face wallboards in the same plane, joints at internal corners of intersecting partitions and joints at internal corners of intersections between ceilings and walls or partitions shall be filled with joint compound.
2. Screw heads and other depressions shall be filled with joint compound. Joint compound shall be applied in three (3) coats, feathered and finish surface sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions. Treatment of joints and screw heads with joint compound is also required where wallboard will be covered by finish materials which require a smooth surface, such as vinyl wall coverings.

3.3 FURRED WALLS AND PARTITIONS

- A. Use specified metal furring channels. Run metal furring channel framing members vertically, space sixteen (16) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stub nails spaced sixteen (16) inches o.c. maximum through alternate wing flanges (staggered) of furring channel. Furring channels shall be shimmed as necessary to provide a plumb and level backing for wallboard. At inside of exterior walls, an asphalt felt protection strip shall be installed between each furring channel and the wall. Furring channel and splices shall be provided by nesting channels at least eight (8) inches and securely anchoring to concrete or masonry with two (2) fasteners in each wing.
- B. Wallboard Installation: Same as specified under Article 3.4 - "Metal Stud Partitions."

3.4 METAL STUD PARTITIONS

- A. Runner Installation: Use channel type. Align accurately at floor according to partition layout. Anchor runners securely sixteen (16) inches o.c. maximum with power-driven anchors to floor slab, with power-driven anchors to structural slab above. See "Stud Installation" below for runners over heads of metal door frames. Where required, carefully remove sprayed-on fireproofing to allow partition to be properly installed.
- B. Stud Installation
 1. Use channel type, positioned vertically in runners, spaced as noted on drawings, but not more than sixteen (16) inches o.c.

2. Anchor studs to floor runners with screw fasteners. Provide snap-in or slotted hole slip joint bolt connections of studs to ceiling runners leaving space for movement. Anchor studs at partition intersections, partition corners and where partition abuts other construction to floor and ceiling runners with sheet metal screws through each stud flange and runner flange.
 3. Connection at ceiling runner for non-rated partitions shall be snap-in or slotted hole slip joint bolt connection that shall allow for movement. Seal studs abutting other construction with 1/8" thick neoprene gasket continuously between stud and abutting construction.
 4. Connections for fire rated partitions at ceiling runners shall conform to UL Design #2079.
 5. Install metal stud horizontal bracing wherever vertical studs are cut or wallboard is cut for passage of pipes, ducts or other penetrations, and anchor horizontal bracing to vertical studs with sheet metal screws.
 6. At jambs of door frames and borrowed light frames, install doubled-up studs (not back to back) from floor to underside of structural deck, and securely anchor studs to jamb anchors of frames and to runners with screws. Provide cross braces from hollow metal frames to underside of slab.
 7. Over heads of door frames, install cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs, and securely anchor runner to adjacent vertical studs with sheet metal screws. Install cut-to-length vertical studs from runner (over heads of door frame) to ceiling runner sixteen (16) inches maximum o.c. and at vertical joints of wallboard, and securely anchor studs to runners with sheet metal screws.
 8. At control joints, in field of partition, install double-up studs (back to back) from floor to ceiling runner, with 1/4" thick continuous compressible gasket between studs. When necessary, splice studs with eight (8) inches minimum nested laps and attach flanges together with two (2) sheet metal screws in each flange. All screws shall be self-tapping sheet metal screws.
- C. Runners and Studs at Chase Wall: As specified above for "Runners" and "Studs" and as specified herein. Chase walls shall have either a single or double row of floor and ceiling runners with metal studs sixteen (16) inches o.c. maximum and positioned vertically in the runners so that the studs are opposite each other in pairs with the flanges pointing in the same direction. Anchor all studs to runner flanges with sheet metal screws through each stud flange and runner flange following requirements of paragraph 3.4, B. Provide cross bracing between the rows of studs by attaching runner channels or studs set full width of chase attached to vertical studs with one self-tapping screw at each end. Space cross bracing not over thirty-six (36) inches o.c. vertically.
- D. Wallboard Installation - Single Layer Application (Screw Attached)
1. Install wallboard with long dimension parallel to framing member and with abutting edge joints over web of framing member. Install wallboard with long dimension perpendicular to framing members above and below openings in

drywall extending to second stud at each side of opening. Joints on opposite sides of wall shall be arranged so as to occur on different studs.

2. Boards shall be fastened securely to metal studs with screws as specified. Where a free end occurs between studs, back blocking shall be required. Center abutting ends over studs. Correct work as necessary so that faces of boards are flush, smooth, true.
3. Wallboard screws shall be applied with an electric screw gun. Screws shall be driven not less than 3/8" from ends or edges of board to provide uniform dimple not over 1/32" deep. Screws shall be spaced twelve (12) inches o.c. in the field of the board and 8" o.c. staggered along the abutting edges.
4. All ends and edges of wallboard shall occur over screwing members (studs or furring channels). Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut, they shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
5. At locations where piping receptacles, conduit, switches, etc., penetrate drywall partitions, provide non-drying sealant and an approved sealant stop at cut board locations inside partition.

E. Wallboard Installation - Double-Layer Application

1. General: See drawings for wallboard partition types required.
2. First Layer (Screw Attached): Install as described above for single layer application.
3. Second Layer (Screw Attached): Screw attach second layer, unless laminating method of attachment indicated on drawings or necessary to obtain required sound rating or fire rating. Install wallboard vertically with vertical joints offset thirty-four (34) inches from first layer joints and staggered on opposite sides of wall. Attach wallboard with 1-5/8" screws sixteen (16) inches o.c. along vertical joints and sixteen (16) inches o.c. in the field of the wallboard. Screw through first layer into metal framing members.
4. Second Layer (Laminated): Install wallboard vertically. Stagger joints of second layer from first layer joints. Laminate second layer with specified laminating adhesive in beads or strips running continuously from floor to ceiling in accordance with manufacturer's instructions. After laminating, screw wallboard to framing members with 1-5/8" screws, spaced twelve (12) inches o.c. around perimeter of wallboard.

F. Wallboard Installation - Laminated Application: Where laminated wallboard is indicated, use specified laminating adhesive, install wallboard vertically and maintain tolerances as specified for screw attached wallboard.

G. Insulation Installation: Install where indicated on drawings. Place blanket tightly between studs.

- H. Deflection of Structure Above: To allow for possible deflection of structure above partitions, provide top runners for non-rated partitions with 1-1/4" minimum flanges and do not screw studs or drywall to top runner. Where positive anchorage of studs to top runner is required, anchorage device shall be by means of slotted hole (in clip connection with screw attachment to web of steel through bushings located in slots of clips), or other anchorage device approved by Architect.

I. Control Joints

1. Leave a 1/2" continuous opening between gypsum boards for insertion of surface mounted joint.
2. Back by double framing members.
3. Attach control joint to face layer with 9/16" galvanized staples six (6) inches o.c. at both flanges along entire length of joint.
4. Provide two (2) inch wide gypsum panel strip or other adequate seal behind control joint in fire rated partitions and partitions with safing insulation.

3.5 DRYWALL FASCIAS AND CEILINGS

- A. Furnish and install inserts, hanger clips and similar devices in coordination with other work.
- B. Secure hangers to inserts and clips. Clamp or bolt hangers to main runners.
- C. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
- D. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
- E. Metal Furring Channels: Space sixteen (16) inches o.c. maximum. Attach to 1-1/2" main runner channels with furring channel clips (on alternate sides of main runner channels). Furring channels shall not be let into or come in contact with abutting masonry walls. End splices shall be provided by nesting furring channels no less than eight (8) inches and securely wire tying. At any openings that interrupt the furring channels, install additional cross reinforcing to restore lateral stability.
- F. Mechanical accessories, hangers, splices, runner channels and other members used in suspension system shall be of metal, zinc coated, or coated with rust inhibitive paint, of suitable design and of adequate strength to support units securely without sagging, and such as to bring unit faces to finished indicated lines and levels.
1. Provide special furring where ducts are over two (2) feet wide.
- G. Apply board with its long dimension at right angles to channels. Locate board butt joints over center of furring channels. Attach board with one (1) inch self-drilling drywall screws twelve (12) inches o.c. in field of board; eight (8) inches o.c. at butt joints located not less than 3/8" from edges.

3.6 SHAFT WALLS

- A. Runner Installation: Use "J" metal runners at floor and ceiling, with the short leg toward finish side of wall. Securely attach runners to structural supports with power-driven fasteners at both ends and twenty-four (24) inches o.c.
- B. Shaft Wall Liner: Cut shaft wall liner panels one (1) inch less from floor to ceiling height and erect vertically between J-runners.
- C. C-H Studs: Cut metal "C-H" studs 3/8" to not more than 1/2" less than floor to ceiling height and install between shaft wall liner panels so that panels are fitted snugly into the one (1) inch wide "H" portion of the stud. Space studs twenty-four (24) inches o.c., unless otherwise indicated on drawings. Install full-length steel E-Studs or runners vertically at T-intersections, corners, door jambs, and columns. Install full length E-Studs over shaft wall liner both sides of closure panels. Frame openings cut within a liner panel with J-Runner around perimeter. For openings, frame with vertical E-Stud or runner at edges, horizontal runner at head and sill, and reinforcing as shown on the drawings. Suitably frame all openings to maintain structural support for wall. Over metal doors, install a cut to length section of runner and attach to strut-studs with clip angles and 3/8" Type S Screws space twelve (12) inches o.c.
- D. Wallboard Installation - Double Layer Installation: Erect gypsum wallboard base layer horizontally one side of studs with end joints staggered. Fasten base layer panels to studs with one (1) inch Type S screws twenty-four (24) inches o.c. Caulk perimeter of base layer panels. Apply gypsum wallboard face layer vertically over base layer with joints staggered and attached with 1-5/8" Type S screws staggered from those in base, spaced eight (8) inches o.c. and driven into studs.
- E. Wallboard Installation (Where Both Sides of Shaft Wall are Finished): Apply gypsum wallboard face layers vertically both sides of studs. Stagger joints on opposite partition sides. Fasten panels with one (1) inch or two (2) inches Type S screws spaced eight (8) inches o.c. in field and along edges into studs.
- F. Where handrails are indicated for direct attachment to drywall shaft system, provide not less than a sixteen (16) ga. x eight (8) inches wide galvanized steel reinforcement strip, accurately positioned and secured to studs and concealed behind not less than one 1/2" thick course of gypsum board in the system.
- G. Integrate stair hanger rods with drywall shaft system by locating cavity of system as required to enclose rods.

3.7 ERECTION AT COLUMN ENCLOSURES

- A. Metal furring supports shall be provided under work of this Section, and shall be cut to lengths as necessary for tight fit such that spacing is not more than sixteen (16) inches o.c.
- B. Board shall be fastened securely to supports with screws as specified. Place boards in position with minimum amount of joints. Where free ends occur between supports, back-blocking or furring shall be required. Center abutting ends over supports. Correct

work as necessary so that faces of boards are flush, smooth and true. Provide clips or cross furring for attachment as required.

- C. All layers shall be screw attached to furring.
- D. When column finish called for on drawings to be in the same plane as drywall finish layer, maintain even, level plane.

3.8 FINISHING

- A. Taping: A thin, uniform layer of taping compound shall be applied to all joints and angles to be reinforced. Reinforcing tape shall be applied immediately, centered over the joint, seated into the compound. A skim coat shall follow immediately, but shall not function as a fill or second coat. Tape shall be properly folded and embedded in all angles to provide a true angle.
- B. Filling: After taping compound has hardened, topping compound shall be applied, filling the board taper flush with the surface. The fill coat shall cover the tape and feather out slightly beyond the tape. On joints with no taper, the fill coat shall cover the tape and feather out at least four (4) inches on either side of the tape. No fill coat is necessary on interior angles.
- C. After topping compound is set, a finishing coat of topping compound shall be spread evenly over and extending slightly beyond the fill coat on all joints and feathered to a smooth, uniform finish. Over tapered edges, the finished joint shall not protrude beyond the plane of the surface. All taped angles shall receive a finish coat to cover the tape and taping compound, and provide a true angle. Where necessary, sanding shall be done between coats and following the final application of compound to provide a smooth surface, ready for painting.
- D. Fastener Depressions: Taping compound shall be applied to all fastener depressions followed, when hardened by at least two (2) coats of topping compound, leaving all depressions level with the plane of the surface.
- E. Finishing Beads and Trim: Taping compound shall be applied to all bead and trim and shall be feathered out from the ground to the plane of the surface. When hardened, this shall be followed by two (2) coats of topping compound each extending slightly beyond the previous coat. The finish coat shall be feathered from the ground to the plane of the surface and sanded as necessary to provide a flat, smooth surface ready for decoration.
- F. Level of finish for surface exposed to view shall conform to Level 4 of ASTM C 840 and GA-214 of the Gypsum Association.
- G. Drywall construction with defects of such character which will mar appearance of finished work, or which is otherwise defective, will be rejected and shall be removed and replaced at no expense to the Owner.

3.9 CLEANING AND ADJUSTMENT

- A. At the completion of installation of the work, all rubbish shall be removed from the building leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building.

- B. Work shall be left in clean condition ready for painting or wall covering. All work shall be as approved by Architect.
- C. Cutting and Repairing: Include all cutting, fitting and repairing of the work included herein in connection with all mechanical trades and all other trades which come in conjunction with any part of the work, and leave all work complete and perfect after all trades have completed their work.

3.10 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION

SECTION 093000

CERAMIC TILE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the ceramic tile as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Ceramic mosaic floor tile.
 - 2. Ceramic glazed wall tile and matching base.
 - 3. Stone tile.
 - 4. Stone saddles.
 - 5. Stone stair treads.
 - 6. Setting beds, grout, sealant and waterproofing membrane.

1.3 RELATED SECTIONS

- A. Concrete - Section 033000.
- B. Masonry - Section 042000.
- C. Gypsum drywall - Section 092900.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: For cutting, installing and grouting of ceramic tile, use only thoroughly trained and experienced journeyman tile setters who are completely familiar with the requirements of this work, and the recommendations contained in the referenced standards.
- B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with the following:
 - 1. Manufacture all ceramic tile in accordance with Standard Grade Requirements of ANSI A-137.1.

2. Install all ceramic tile in accordance with the recommendations contained in Handbook for Ceramic Tile Installation of the Tile Council of America, Inc., latest edition.

SUBMITTALS

C. Samples

1. Before any ceramic tile is delivered to the job site, submit to the Architect sample panels, approx. 12" x 12", mounted on hardboard back-up with selected grout color for each color and pattern of ceramic tile and grout specified.
2. Submit 6" length of stone saddles.
3. Submit 12" x 12" samples of waterproofing membrane.

D. Master Grade Certificates: Prior to opening ceramic tile containers, submit to the Architect a Master Grade Certificate, signed by an officer of the firm manufacturing the ceramic tile used, and issued when the shipment is made, stating the grade, kind of tile, identification marks for tile containers, and the name and location of the project.

E. Mock-ups

1. At an area on the site where approved by the Architect, provide a mock-up ceramic tile installation.
 - a. Make the mock-up approximately 36" x 36" in dimension.
 - b. Provide one mock-up for each type, class, and color of installation required under this Section.
 - c. The mock-ups may be used as part of the Work, and may be included in the finished Work when so approved by the Architect.
 - d. Revise as necessary to secure the Architect's approval.
2. The mock-ups, when approved by the Architect, will be used as datum for comparison with the remainder of the work of this Section for the purposes of acceptance or rejection.
3. If the mock-up panels are not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of the work of this Section.

1.5 PRODUCT HANDLING

A. Delivery and Storage

1. Deliver all materials of this Section to the job site in their original unopened containers with all labels intact and legible at time of use.
2. Store all materials under cover in a manner to prevent damage and contamination; store only the specified materials at the job site.

- B. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.
- C. Maintain temperatures at not less than 50 deg. F. in tiled areas during installation and for 7 days after completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS OF TILE

- A. Provide tile manufactured by American Olean, or equivalent of Dal-Tile, Summitville Tiles Inc., or approved equal meeting these specifications. The Architect reserves the right to pick tile from any price group.

2.2 WALL TILE AND BASE

- A. Provide vitreous, cushion edge units, 2" x 2" x 1/4" thick, matte glazed, in colors as selected by the Architect.
- B. Provide sanitary cove base to match wall tile.

2.3 FLOOR TILE

- A. Provide porcelain type ceramic mosaic floor tile with all-purpose edge in size, color and pattern as selected by the Architect. Tile to have water absorption not to exceed 0.5%.
- B. Provide non-slip tile where scheduled, of same characteristics as ceramic mosaics specified herein with the addition of 7-1/2% abrasive grain by weight.

2.4 TRIM AND SPECIAL SHAPES

- A. Provide external and internal corners, trim shapes at openings, and all other trim and special shapes to match the tile specified herein, as required by field conditions and drawing details.

2.5 TILE TYPES

- A. Tile A: Supplied by StoneSource - Concordia stone tile, 12 x 24. Finish: Velvet
- B. Tile C: Manufactured by American Olean - Satinglo field tile, 2 x 2. Color: D14 Sterling.

- C. Tile D: Manufactured by American Olean - Satinglo field tile, 2 x 2. Color: D14 Sterling.
- D. Tile E: Manufactured by American Olean - Martinique, 3 x 6. Color: MT25 Gloss Ice White.

2.6 STONE SADDLES

- A. Provide sound stone as supplied by StoneSource, Concordia or equal, min. 3/4" thick, with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C 241.
- B. Finish: Velvet
- C. Cut saddle to fit jamb profile.

2.7 STONE STAIR TREADS

- A. Supplied by StoneSource - Concordia, 3/4" thick slab.
- B. Finish: Velvet

2.8 SETTING BEDS AND GROUT

- A. Portland Cement: ASTM C 150, Type 1.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Sand: ASTM C 144, clean and graded natural sand.
- D. Reinforcing for Mud Set Systems: 2" x 2" x 16/16 ga. welded wire mesh.
- E. Latex Additives: As manufactured by Laticrete or Mapei as follows:
 - 1. Laticrete 272 premium floor and wall thin set mortar, fortified with Laticrete 333 Mortar Admix.
 - 2. Mapei Kerabond thin set mortar, fortified with Ker 310 Keralastic System additive.
- F. Wall and Base Tile
 - 1. Over drywall use ANSI A136.1-1967 Organic Adhesive for installation of Ceramic Tile, Type I. Shear strength shall be 50 psi minimum. Adhesive primer as recommended by adhesive manufacturer. Manufacturer shall certify, in writing, that adhesive and primer used are proper types for the intended tile types and application. Conform to TCA Detail W-242.
 - 2. Over cement board use a Latex Portland cement mortar bond coat conforming to ANSI A118.4 and TCA Detail W-244; coat back of board with waterproof membrane as specified below.
 - 3. Over glass mat water resistant gypsum backer board use a Latex Portland cement mortar bond coat conforming to ANSI A118.4 and TCA Detail W-245.

- G. Floor Tile and Stone Saddle - Mud Set: Set floor tile and stone saddle using Portland Cement mortar setting bed conforming to ANSI A108.1A and latex modified Portland cement bond coat conforming to ANSI A118.4 and TCA Detail F-112.
- H. Floor Tile and Stone Saddle - Thin Set: Set floor tile and stone saddle using latex modified dry set Portland Cement mortar conforming to ANSI A118.4 and TCA Detail F-113.
- I. Floor Tile and Stone Saddle - Waterproof Setting Bed: Set floor tile and stone saddle using thin set latex Portland cement bond coat conforming to ANSI A118.4 and waterproofing membrane conforming to TCA Detail F-122. Use this system where toilet room occurs over occupied space other than another toilet room and wherever else noted on drawings.
- J. Waterproofing Membrane: "Laticrete 9235 with Mircoban" made by Laticrete International or approved equal.
- K. Water: Clean, fresh and suitable for drinking.
- L. Grout: For grouting ceramic tile, provide a commercial Portland cement grout made by Laticrete, Mapei, or approved equal; color as selected by the Architect. Add latex additive to grout made by same manufacturer as grout.
- M. Physical Properties: The setting beds and grouts must meet the following physical requirements:
 - 1. Compressive Strength: 3000 psi min.
 - 2. Shear Bond Strength: 500 psi min.
 - 3. Water Absorption: 4.0% max.
 - 4. Service Rating (ASTM C 627): Extra Heavy Duty.

2.9 SEALANT

- A. Joint Backing: Preformed, compressible, resilient, non-extruding, non-staining strips of foam neoprene, foam polyethylene, or other material recommended by sealant manufacturer.
- B. Bond Breaker: Polyethylene tape, 3 mils thick, or other material recommended by sealant manufacturer.
- C. Sealant Primer: Colorless, non-staining, or type to suit substrate surface, as recommended by sealant manufacturer.
- D. Sealant: One-part silicone based sanitary sealant, conforming to ASTM C 920, Type S, NS, Class 25. Sealant hardness upon full cure shall be between 20-30 Shore "A" Durometer. Color of sealant to blend with or match adjacent materials, and as selected by the Architect. Sealant shall be equivalent to 1700 Sanitary Sealant made by General Electric or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where ceramic tile is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 CONDITION OF SURFACES

- A. Allowable Variations in Substrate Levels in Floors: + 1/8" in 10'-0" distance and 1/4" total max. variation from levels shown.
- B. Grind or fill concrete and masonry substrates as required to comply with allowable variations.

3.3 PREPARATION

- A. Coordinate the following with Section 033000:
 - 1. Steel trowel and fine broom finish concrete slabs that are to receive ceramic tile. Cure concrete slabs that are to receive tile before tile application. Do not use liquid curing compounds or other coatings that may prevent bonding of tile setting materials to slabs. Slab shall be dry at time of tile installation.
- B. Etch concrete substrate as may be required to remove curing compounds or other substances that would interfere with proper bond of setting bed. Rinse with water to remove all traces of treatment.
- C. Seal substrate with sealer as recommended by manufacturer of mortar or adhesive.

3.4 JOINTS IN TILE WORK

- A. Joint Widths: 1/16" wide in ceramic tile.
- B. Alignment: Wall, base and floor joints shall align through the field and trim. Direction and location of all joints as directed by Architect.
- C. Movement Joints: Conform to TCA Detail EJ171. Locate where movement joints are in back-up material. Provide movement joint at joints between mop receptors and ceramic tile. Provide movement joint at all vertical internal joints of wall tile. Movement joints 1/8" wide in ceramic tile. Fill all movement joints with specified backing and sealant. Use bond breaker where sufficient space for joint backing does not exist.
 - 1. Provide sealant between ceramic tile and plumbing fixtures, mirrors, pipes, countertops and other dissimilar materials penetrating or adjacent to ceramic tile.

3.5 INSTALLATION

- A. Comply with the following installation standards

1. Wall tile over drywall using organic adhesive - ANSI A108.4 and A108.10.
 2. Wall tile over cement board or glass mat backer board using dry set mortar - ANSI A108.5 and A108.10.
 3. Floor tile using full mud set mortar - ANSI A108.1 and A108.10.
 4. Floor tile using dry set mortar - ANSI A108.5 and A108.10.
 5. Floor tile over waterproofing membrane - ANSI A108.5 and A108.10.
- B. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignment shown.
1. Floors: 1/8" in 10'-0" run, any direction; +/- 1/8" at any location; 1/32" offset at any location.
 2. Walls: 1/8" in 8'-0" run, any direction; 1/8" at any location; offset at any location, 1/32".
 3. Joints: +/- 1/32" joint width variation of any location; 1/16" in 3'-0" run deviation from plumb and true.
- C. Waterproofing Membrane
1. Install the membrane in strict accordance with manufacturer's written recommendations.
 2. Upon completion of work, test horizontal membrane for leaks by plugging the drain or damming areas and filling with water. Inspect for leakage. Make necessary adjustments to stop all leakage and retest until watertight. If membrane is not covered by another surface immediately, provide protection until membrane is covered.
- D. Handle, store, mix and apply setting and grouting materials in compliance with the manufacturer's instructions.
- E. Extend tile work into recesses and under equipment and fixtures, to form a complete covering without interruptions. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignment.
- F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping and fixtures so that plates, collars, or covers overlap tile.
- G. Lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are the same size. Lay out tile work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.

3.6 INSTALLATION OF STONE SADDLES

- A. Install stone saddles cut to profiles and sizes shown, accurately fitted to jambs, coped at stops, set in full bed of mortar herein specified, and with grouted edge joints as specified for floor tile.

3.7 CLEANING AND PROTECTION OF CERAMIC TILE

- A. Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
- B. Apply to all clean completed tile walls and floors a protective coating of neutral cleaner solution, 1 part cleaner to 1 part water.
- C. Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile work.
- D. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent damage and wear. Prohibit foot and wheel traffic from using tiled floors for at least 3 days after grouting is completed. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 096500

RESILIENT TILE FLOORING AND BASE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the resilient tile flooring, base and stair treads, as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Vinyl composition tile (VCT).
 - 2. Rubber base.
 - 3. Transition strips.
 - 4. Accessories.

1.3 RELATED SECTIONS

- A. Concrete slab - Section 033000.
- B. Gypsum board partitions - Section 092900.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

1.5 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's technical information and installation instructions for type of resilient tile flooring, base and stair tread.
- B. Samples:
 - 1. Submit full-size sample tiles for each type and color required, representative of the expected range of color and pattern variation. Sample submittals will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
 - 2. Submit six (6) inch long samples of base.

3. Submit full-size samples of stair treads.

1.6 DELIVERY AND STORAGE

- A. Deliver materials to the project site in the manufacturer's original unopened containers, clearly marked to indicate pattern, gauge, lot number and sequence of materials.
- B. Carefully handle all materials and store in original containers at not less than seventy (70) degrees F. for at least forty-eight (48) hours before start of installation.

1.7 JOB CONDITIONS

- A. Continuously heat spaces to receive tile to a temperature of seventy (70) degrees F. for at least forty-eight (48) hours prior to installation, whenever project conditions are such that heating is required. Maintain seventy (70) degrees F. temperature continuously during and after installation as recommended by the tile manufacturer, but for not less than forty-eight (48) hours. Maintain a temperature of not less than fifty-five (55) degrees F. in areas where work is completed.

PART 2 PRODUCTS

2.1 TILE

- A. Tile B: VCT manufactured by Armstrong, Excelon Stonetex. Color: 13, Shale.
- B. Provide 12" x 12" x 1/8" thick vinyl composition tile conforming to ASTM F 1066, Class 2, equal to "Excelon Stonetex," color Granite Gray 52125, made by Armstrong, or equal made by Mannington, Tarkett, or approved equal. Provide tile units with uniformly distributed color and pattern throughout the thickness of tile. Variations in shades and off-pattern matches between containers are not acceptable.

2.2 RUBBER BASE

- A. Base: Manufactured by Armstrong, color integrated wall base. Color: 71 Mid Gray.
- B. Provide 4" high by 1/8" thick, continuous vulcanized SBR rubber, top set cove base with pre-formed internal and external corner pieces, color as selected by the Architect. For areas to receive carpet, provide flat base, no cove. Base shall conform to ASTM F 1861, Type TS, Group 1 (solid) as manufactured by Armstrong, or equivalent of Burke Mercer, Roppe, Johnsonite, or approved equal.

2.3 ACCESSORIES

- A. Adhesives: Waterproof, stabilized type, as recommended by the manufacturer of base and stair treads for the type of service indicated.
- B. Concrete Slab Primer: Non-staining type recommended by the tile manufacturer.
- C. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, H.B. Fuller or approved equal.

- D. Edging Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, color as selected by the Architect from manufacturer's standards.
- E. Finish
 - 1. Cleaner shall be equal to "Super Shine All" made by Hillyard Chemical Co., or approved equal.
 - 2. Wax shall be equal to "Super Hil-Brite" made by Hillyard Chemical Co., or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where resilient tile flooring is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 CONDITION OF SURFACES

- A. Allowable Variations in Substrate Levels (Floors): $\pm 1/8"$ in 10'-0" distance and 1/4" total maximum variation from levels shown.
- B. Grind or fill concrete and masonry substrates as required to comply with allowable variation.

3.3 PREPARATION

- A. Etch concrete substrate as may be required to remove curing compounds or other substances that would interfere with proper bond of adhesive for tile. Rinse with water to remove all traces of treatment.
- B. Perform moisture tests on concrete slabs to determine that concrete surfaces are sufficiently cured and are ready to receive tile installation.
- C. Concrete Primer: Apply concrete slab primer if recommended by tile manufacturer, prior to application of the adhesive. Apply in compliance with manufacturer's directions.

3.4 ALLOWABLE TOLERANCES

- A. Allowable Tolerances in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignment shown.
 - 1. Floors: 1/8" in 10'-0" run, any direction; 1/32" offset at any location.

3.5 INSTALLATION

- A. Install tile only after all finishing operations, including painting, have been completed and permanent heating system is operating. Moisture content of concrete slabs,

building air temperature and relative humidity must be within limits recommended by tile manufacturer.

- B. Place tile units with adhesive cement in strict compliance with the manufacturer's recommendations. Butt tile units tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions and to produce neat joints, laid tight, even and in straight, parallel lines. Extend tile units into toe spaces, door reveals, and into closet and similar openings.
- C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on the finish tile as marked in the subfloor. Use chalk or other non-permanent marking devices.
- D. Lay tile from center marks established with principal walls, discounting minor off-sets, so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.
- E. Match tiles for color and pattern by using tile from cartons in the same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tile is not acceptable.
- F. Tightly cement tile to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks through tile, or other surface imperfections.
- G. Lay tile with grain in all tile running in the same direction.
- H. Place resilient edge strips tightly butted to tile and secure with adhesive. Provide edging strips at all unprotected edges of tile, unless otherwise shown.
- I. Base: In all spaces where base is indicated, install base tight to walls, partitions, columns, built-in cabinets, etc., without gaps at top or bulges at bottom, with tight joints and flush edges, with molded corner pieces at internal and external corners. Provide end stops adjacent to flush type door frames and where base does not terminate against an adjacent surface. Keep base in full contact with walls until adhesive sets.

3.6 CLEANING AND PROTECTION

- A. Remove any excess adhesive or other surface blemishes from tile, using neutral type cleaners as recommended by the tile manufacturer. Protect installed flooring from damage by use of heavy Kraft paper or other covering.
- B. Finishing: After completion of the project and just prior to the final inspection of the work, thoroughly clean tile floors and accessories. Apply two (2) coats of wax and buff using materials as specified herein.

END OF SECTION

SECTION 096510

RESILIENT SHEET FLOORING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the resilient sheet flooring, as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Rubber sheet flooring and cove base.
 - 2. Adhesive.
 - 3. Accessories.

1.3 RELATED SECTIONS

- A. Concrete slab - Section 033000.
- B. Gypsum board partitions - Section 092900.
- C. Rubber base and stair treads - Section 096500.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

1.5 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's technical information and installation instructions for type of rubber flooring required.
- B. Samples: Submit samples of each color of rubber flooring required. Provide twelve (12) inch square samples to illustrate the range of color and pattern variation. Sample submittals will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
- C. Maintenance Instructions: Submit two (2) copies of manufacturer's written instructions for recommended maintenance practices for rubber flooring.

- D. Certificates: Submit material certificates signed by manufacturer certifying that the rubber flooring complies with requirements specified herein.
- E. Shop Drawings: Submit shop drawings of pattern and color layout for floor surface, including location of seams. Show all dimensions.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer or applicator who has specialized in installing rubber flooring similar to that required for this Project and who is acceptable to manufacturer of primary materials and has a minimum of 5 years experience installing this floor system.
- B. Single-Source Responsibility: Obtain rubber flooring materials, including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
- B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with flooring manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation, and other conditions required to execute and protect Work.
- B. Lighting: Permanent lighting will be in place and working before installing rubber flooring.
- C. Coordination: Coordinate installation of rubber flooring with installer of radiant heat flooring system.

1.9 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 RUBBER FLOORING MATERIALS

- A. Product: Provide "EcoEarth" rubber roll flooring and "EcoSilence" underlayment by EcoSurface division of Dodge-Regupol, Inc., or approved equal acceptable to the Architect.
- B. Rubber flooring shall be manufactured from a combined of 100% post-consumer recycled SBR (styrene butadiene rubber), EPDM (ethylene propylene diene monomer) rubber and polyurethane.
- C. Physical Properties: Provide flooring system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.
 - 1. Surface Hardness Shore A Durometer (ASTM D 2240): 64 indentation hardness.
 - 2. Tensile Strength (ASTM D 412): 200 lbs./sq. in.
 - 3. Critical Radiant Flux (ASTM E 648): Class II.
 - 4. Abrasion (ASTM C 501): 0.8% wt. loss
 - 5. Material Emissions, VOC (ASTM D 5116): Pass.

2.2 ACCESSORIES

- A. Adhesives: Waterproof, stabilized type, as recommended by the manufacturer for the type of service indicated.
- B. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, H.B. Fuller or approved equal.
- C. Edging Strips: 1/8" thick, homogeneous rubber composition, tapered or bullnose edge, color as selected by the Architect.
- D. Concrete Slab Primer: Non-staining type as recommended by the rubber flooring manufacturer.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where the rubber flooring is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Architect.
 - 1. Concrete substrate shall be in place a minimum of thirty days prior to the installation of the rubber flooring.

2. Moisture content of the substrate shall not exceed 3%.
3. Inserts, penetrations and other construction items which affect the installation of the prefabricated rubber flooring shall be in place.

3.2 PREPARATION

- A. Substrate: Perform preparation and cleaning procedures according to flooring manufacturer's instructions for particular substrate conditions involved, and as specified. Provide clean, dry, and neutral substrate for flooring application.
 1. Correct deficiencies in substrate prior installation.
- B. Where rubber flooring is indicated to be installed over radiant floor heating system, comply with the heating system manufacturer's instructions regarding running of system prior to the installation of rubber flooring.

3.3 INSTALLATION

- A. Install rubber flooring in accordance with manufacturer's recommendations.

3.4 CLEANING AND PROTECTION

- A. Protect floor coverings from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 1. Cover flooring with undyed, untreated building paper until Substantial Completion.
 2. Do not move heavy and sharp objects directly over rubber flooring. Place plywood or hardboard panels over flooring and under objects while they are being moved.

END OF SECTION

SECTION 096813

CARPET TILE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor materials, equipment, and services necessary to complete the carpet tile from InterfaceFLOR as shown on the drawings and/or specified herein, including, but not limited to, the following:

- 1. Carpet tile.
- 2. Adhesive.

1.3 RELATED SECTIONS

- A. Concrete sub-floor – Section 033000.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with not less than five (5) years of experience in installation of commercial carpeting of type, quantity and installation methods similar to work of this Section.
- B. General Terminology/ Information Standard: Refer to current edition of "Carpet Specifier's Handbook" by The Carpet and Rug Institute for definitions of terminology not otherwise defined herein, and for general recommendations and information.
- C. Carpet used on Project must be from same dye lot for each carpet type.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's complete technical product data for each type of carpet, cushion and accessory item required.
- B. Samples: Submit full size samples of carpet tile and six (6) inches long samples of each type exposed edge stripping.
- C. Certification: Submit manufacturer's certification stating that carpet materials furnished comply with specified requirements.
 - 1. Include listing of mill register numbers for carpet furnished.
 - 2. Include supporting certified laboratory test data indicating that carpet meets or exceeds specified test requirements.

- D. Maintenance Data: Submit manufacturer's printed maintenance recommendations, including methods and frequency recommended for maintaining carpet in optimum conditions under anticipated traffic and use conditions.

1.6 EXTRA STOCK

- A. Produce and deliver to project at least five (5) percent overrun on calculated yardage. Provide required overrun exclusive of carpet needed for proper installation, waste and usable scraps.

1.7 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting materials in original mill protective wrapping with mill register numbers and tags attached. Store inside, in well ventilated area, protected from weather, moisture and soiling.

1.8 WARRANTY

- A. Provide special project warranty, signed by Contractor and Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work during two (2) year warranty period following substantial completion. Attach copies of product warranty.

PART 2 PRODUCTS

2.1 CARPET TILE

- A. Provide 19.69" x 19.69" (50cm x 50 cm) GlasBac carpet tile, Style: 1381502500 Plain Weave 24Z IC 50cm Color: 6095 Spindle

2.2 ACCESSORIES

- A. Adhesive for Carpet Tile: Provide release type adhesive as recommended by the carpet tile manufacturer for use with carpet tile specified. Provide adhesive which complies with flame spread rating required for the carpet installation.
- B. Miscellaneous Materials: Provide the types of adhesives and tape, and other accessory items recommended by the carpet manufacturer and Installer for the conditions of installation and use.
- C. Leveling Compound: Latex/Portland cement flashing patching and leveling compound equal to No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, H. B. Fuller or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where carpet tile is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PRE-INSTALLATION REQUIREMENTS

- A. Floor shall be clean and free of cracks and protrusions. Any gaps or cracks more than 1/16" wide to be filled in with latex leveling compound. Protrusions must be sanded down smooth, the floor cleanly swept and vacuumed if necessary to remove all dust and grit.
- B. Floor temperature shall be 65 deg., at least 24 hrs. prior to installation; and 48 hrs. after carpet is installed.
- C. Conduct a moisture test. The presence of moisture in the concrete floor will interfere with the curing and subsequent performance of the adhesive. Conduct the test as follows:
 - 1. Drive a concrete nail a half inch into the floor. Then remove the nail.
 - 2. Place a small amount of anhydrous calcium chloride or calcium sulphate crystals over the hole.
 - 3. Cover the crystals and the hole with a piece of flat glass and seal the edges with waterproof tape or putty. Since concrete pourings vary, repeat the test every 1500 sq. ft.
 - 4. Leave in place 72 hours. Any color change in the crystals indicates the presence of moisture. Do not apply carpet until slab is free of moisture and meets with approval of carpet adhesive manufacturer.
- D. Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period.

3.3 INSTALLATION

- A. General
 - 1. Comply with manufacturer's instructions and recommendations. Maintain direction of pattern and texture, including lay of pile.
 - 2. Adhere all tiles with a full spread of adhesive. Dry-fit cut tiles and apply adhesive to tile back after tile has been cut.
 - 3. Tiles shall be installed in a monolithic corner to corner manner following arrows printed on back of each tile indicating pile direction. Tiles shall be installed to achieve patterns as directed by the Architect.
 - 4. Vinyl reducer strips shall be used along any necessary open edges so as to maintain the fixed perimeter.

3.4 CLEANING UP

- A. Upon completion of the carpeting installation in each area, visually inspect all carpet installed in that area and immediately remove all dirt, soil, and foreign substance from the exposed face; inspect all adjacent surfaces and remove all marks and stains caused by the carpet installation: remove all packaging materials, carpet scraps, and other debris from the carpet installation to the area of the job site set aside for its storage.

3.5 PROTECTION

- A. In all areas, provide a temporary non-staining paper pathway in the direction of traffic.

END OF SECTION

SECTION 099000

PAINTING AND FINISHING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the painting and finishing as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Prime painting unprimed surfaces to be painted under this Section.
 - 2. Painting all items furnished with a prime coat of paint, including touching up of or repairing of abraded, damaged or rusted prime coats applied by others.
 - 3. Painting all ferrous metal (except stainless steel) exposed to view.
 - 4. Painting all galvanized ferrous metals exposed to view.
 - 5. Painting interior concrete block exposed to view.
 - 6. Painting gypsum drywall exposed to view.
 - 7. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
 - 8. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
 - 9. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
 - 10. Painting of any surface not specifically mentioned to be painted herein or on drawings, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, shall be included as though specified.

1.3 RELATED SECTIONS

- A. Shop priming is required on some, but not all of the items scheduled to be field painted. Refer to other Sections of work for complete description.
- B. Shop coat on machinery and equipment: Refer to the Sections under which various items of manufactured equipment with factory applied shop prime coats are furnished,

including, but not necessarily limited to, the following Sections. All items of equipment furnished with prime coat finish shall be finish painted under this Section.

1. Plumbing - Division 22.
2. Heating, ventilation and air conditioning - Division 23.
- C. Intumescent coatings - Section 099646.
- D. Color Coding of Mechanical Piping and Electrical Conduits - Divisions 22 and 26.
 1. This Color Coding consists of an adhesive tape system and is in addition to painting of piping and conduits under this Section, as specified above.

1.4 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- A. Items of equipment furnished with complete factory finish, except for items specified to be given a finish coat under this Section.
- B. Factory-finished toilet partitions.
- C. Factory-finished acoustical tile.
- D. Non-ferrous metals, except for items specified and/or indicated to be painted.
- E. Finished hardware, excepting hardware that is factory primed.
- F. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

1.5 QUALITY ASSURANCE

- A. Job Mock-Up
 1. In addition to the samples specified herein to be submitted for approval, apply in the field, at their final location, each type and color of approved paint materials, applied 10 feet wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the Architect. Paint mock-ups to include door and frame assembly.
 2. These applications when approved will establish the quality and workmanship for the work of this Section.
 3. Repaint individual areas which are not approved, as determined by the Architect, until approval is received. Assume at least two paint mock-ups of each color and gloss for approval.
- B. Qualification of Painters: Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces.
- C. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of

the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect in writing of any anticipated problems using the coating systems as specified with substrates primed by others.

- D. All paints must conform to the Volatile Organic Compounds (VOC) standards of prevailing codes and ordinances.

1.6 SUBMITTALS

A. Materials List

1. Before any paint materials are delivered to the job site, submit to the Architect a complete list of all materials proposed to be furnished and installed under this portion of the work.
2. This shall in no way be construed as permitting substitution of materials for those specified or accepted for this work by the Architect.

B. Samples

1. Accompanying the materials list, submit to the Architect copies of the full range of colors available in each of the proposed products.
2. Upon direction of the Architect, prepare and deliver to the Architect two (2) identical sets of Samples of each of the selected colors and glosses painted onto 8-1/2" x 11" x 1/4" thick material; whenever possible, the material for Samples shall be the same material as that on which the coating will be applied in the work.

- C. Manufacturer's Recommendations: In each case where material proposed is not the material specified or specifically described as an acceptable alternate in this Section of these specifications, submit for the Architect's review the current recommended method of application published by the manufacturer of the proposed material.

1.7 PRODUCT HANDLING

- A. Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use.

B. Protection

1. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
3. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.8 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the Owner an extra stock of paint equaling approximately ten (10) percent of each color and gloss used and each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

1.9 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.1 PAINT MANUFACTURERS

- A. Except as otherwise noted, provide the painting products listed for all required painting made by one of the manufacturers listed in the paint schedule (Section 2.4). These companies are Benjamin Moore, MAB Paints, ICI Dulux and Sherwin Williams (S-W). Comply with number of coats and required minimum mil thicknesses as specified herein.

2.2 MATERIALS

- A. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- B. Colors and Glosses: All colors and glosses shall be as selected by the Architect. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the Architect. Color schedule (with gloss) shall be furnished by the Architect.
- C. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- D. Linseed Oil: Raw or boiled, as required, of approved manufacture, per ASTM D 234 and D 260, respectively.
- E. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D 13.

- F. Shellac: Pure gum shellac (white or orange) cut in pure denatured alcohol using not less than four (4) lbs. of gum per gallon of alcohol.
- G. Driers, Putty, Spackling Compound, Patching Plaster, etc.: Best quality, of approved manufacture.
- H. Heat Resistant Paint: Where required, use heat resistant paint when applying paint to heating lines and equipment.

2.3 GENERAL STANDARDS

- A. The various surfaces shall be painted or finished as specified below in Article 2.4. However, the Architect reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the Owner.
- B. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the manufacturer's instructions printed thereon.
- C. All painting materials shall bear identifying labels on the containers with the manufacturer's instructions printed thereon.
- D. Paint shall not be badly settled, caked or thickened in the container, shall be readily dispersed with a paddle to a smooth consistency and shall have excellent application properties.
- E. Paint shall arrive on the job color-mixed except for tinting of under-coats and possible thinning.
- F. All thinning and tinting materials shall be as recommended by the manufacturer for the particular material thinned or tinted.
- G. It shall be the responsibility of the Contractor to see that all mixed colors match the color selection made by the Architect prior to application of the coating.

2.4 SCHEDULE OF FINISHES

- A. Exterior Galvanized Ferrous Metal Garage Door and Exhaust Grille

First Coat: PPG Industries Coating.
Second Coat: PPG Industries, Inc Glass Coatings Paint 3HR762691 Truform
Color: H/G Red
Third Coat: Same as Second Coat.
or equal.

- B. Exterior Galvanized Ferrous Metal Doors

First Coat: PPG Industries Coating.
Second Coat: PPG Industries, Inc Glass Coatings Paint
Color: To be selected by architect to match anodized aluminum finish
Third Coat: Same as Second Coat.
or equal.

- C. Interior Galvanized Ferrous Metal Doors

First Coat: PPG Industries Coating.
Second Coat: PPG Industries, Inc Glass Coatings Paint
Color: To be selected by architect to match anodized aluminum finish
Third Coat: Same as Second Coat.
or equal.

D. Interior Architecturally Exposed Structural Steel (AES)

Semi-Gloss Finish/Enamel

Primer: 1 coat Acrylic Metal Primer, or touch-up shop primer

First Coat: 1 coat Benjamin Moore Interior Latex Satin Enamel,
Color: OC-68 Distant Gray

Second Coat: 1 coat Benjamin Moore Interior Latex Satin Enamel,
Color: OC-68 Distant Gray

Total DFT not less than: 3.0 mils
or equal.

E. Interior Drywall Ceilings

Flat Finish/Vinyl Acrylic Latex

Primer: 1 coat Benjamin Moore Interior Latex

First Coat: 1 coat Benjamin Moore Interior Latex Flat,
Color: OC-68 Distant Gray

Second Coat: 1 coat Benjamin Moore Latex Flat,
Color: OC-68 Distant Gray

Total DFT not less than: 2.2 mils
or equal.

F. Interior Drywall Partitions - Typical

Eggshell Finish/Vinyl Acrylic Latex

Primer: 1 coat Benjamin Moore Interior Latex

First Coat: 1 coat Benjamin Moore Interior Latex Eggshell,
Color: AC-25 Harbor Gray

Second Coat: 1 coat Benjamin Moore Latex Eggshell,
Color: AC-25 Harbor Gray

Total DFT not less than: 2.2 mils
or equal.

G. Interior Drywall Partitions - End Wall Second Floor

Eggshell Finish/Vinyl Acrylic Latex

Primer: 1 coat Benjamin Moore Interior Latex

First Coat: 1 coat Benjamin Moore Interior Latex Eggshell,
Color: 2003-10 Million Dollar Red

Second Coat: 1 coat Benjamin Moore Latex Eggshell,
Color: 2003-10 Million Dollar

Total DFT not less than: 2.2 mils
or equal.

2.5 PIPING AND MECHANICAL EQUIPMENT EXPOSED TO VIEW

- A. Paint all exposed piping, conduits, ductwork and mechanical and electrical equipment. Use heat resisting paint when applied to heating lines and equipment. The Contractor is cautioned not to paint or otherwise disturb moving parts in the mechanical systems. Mask or otherwise protect all parts as required to prevent damage.
- B. Exposed Uncovered Ductwork, Piping, Hangers and Equipment: Latex Enamel Undercoater and one (1) coat Acrylic Latex Flat.
- C. Exposed Covered Piping, Duct Work and Equipment: Primer/Sealer and one (1) coat Acrylic Latex Flat.
- D. Panel Boards, Grilles and Exposed Surfaces of Electrical Equipment: Latex Enamel Undercoater and two (2) coats Latex Semi-Gloss.
- E. Equipment or Apparatus with Factory-Applied Paint: Refinish any damaged surfaces to match original finish. Do not paint over name plates and labels.
- F. All surfaces of insulation and all other work to be painted shall be wiped or washed clean before any painting is started.
- G. All conduit, boxes, distribution boxes, light and power panels, hangers, clamps, etc., are included where painting is required.
- H. All items of Mechanical and Electrical trades which are furnished painted under their respective Contracts shall be carefully coordinated with the work of this Section so as to leave no doubt as to what items are scheduled to be painted under this Section.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL WORKMANSHIP REQUIREMENTS

- A. Only skilled mechanics shall be employed. Application may be by brush or roller. Spray application only upon acceptance from the Architect in writing.
- B. The Contractor shall furnish the Architect a schedule showing when he expects to have completed the respective coats of paint for the various areas and surfaces. This schedule shall be kept current as the job progresses.
- C. The Contractor shall protect his work at all times, and shall protect all adjacent work and materials by suitable covering or other method during progress of his work. Upon completion of the work, he shall remove all paint and varnish spots from floors, glass and other surfaces. He shall remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and shall leave his part of the work in clean, orderly and acceptable condition.

- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide ample in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. Remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. All materials shall be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.
- G. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the Owner.
- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

3.3 PREPARATION OF SURFACES

- A. Existing Surfaces: Clean existing surfaces requiring paint or finishing, remove all loose and flaking paint or finish and sand surface smooth as required to receive new paint or finish. No "telegraphing" of lines, ridges, flakes, etc., through new surfacing is permitted. Where this occurs, Contractor shall be required to sand smooth and re-finish until surface meets with Architect's approval.
- B. General
 - 1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished shall be perfectly dry, clean and smooth.
 - 2. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
 - 3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
- C. Metal Surfaces
 - 1. Weld Fluxes: Remove weld fluxes, splatters, and alkali contaminants from metal surfaces in an approved manner and leave surface ready to receive painting.

2. Bare Metal: Thoroughly clean off all foreign matter such as grease, rust, scale and dirt before priming coat is applied. Clean surfaces, where solder flux has been used, with benzene. Clean surfaces by flushing with mineral spirits. For aluminum surfaces, wipe down with an oil free solvent prior to application of any pre-treatment.
 3. Shop Primed Metal: Clean off foreign matter as specified for "Bare Metal." Prime bare, rusted, abraded and marred surfaces with approved primer after proper cleaning of surfaces. Sandpaper all rough surfaces smooth.
 4. Galvanized Metal: Prepare surface as per the requirements of ASTM D 6386.
 5. Metal Filler: Fill dents, cracks, hollow places, open joints and other irregularities in metal work to be painted with an approved metal filler suitable for the purpose and meeting the requirements of the related Section of work; after setting, sand to a smooth, hard finish, flush with adjoining surface.
- D. Gypsum Drywall Surfaces: Scrape off all projections and splatters, spackles all holes or depressions, including taped and spackled joints, sand smooth. Conform to standards established in Section 092900 Gypsum Drywall.
- E. Block Masonry Surfaces: Thoroughly clean off all grit, grease, dirt mortar drippings or splatters, and other foreign matter. Remove nibs or projections from masonry surfaces. Fill cracks, holes or voids, not filled under the "Masonry" Section, with Portland cement grout, and bag surface so that it has approximately the same texture as the adjacent masonry surface.
- F. Testing for Moisture Content: Contractor shall test all masonry and drywall surfaces for moisture content using a reliable electronic moisture meter. Contractor shall also test latex type fillers for moisture content before application of top coats of paint. Do not apply any paint or sealer to any surface or to latex type filler where the moisture content exceeds seven (7) percent as measured by the electronic moisture meter.
- G. Touch-Up: Prime paint all patched portions in addition to all other specified coats.
- 3.4 MATERIALS PREPARATION
- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.
 - B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
 - C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
 - D. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

A. General

1. Apply paint by brush or roller in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.
2. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.
3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - a. "Exposed surfaces" is defined as those areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, etc., are in place in areas scheduled to be painted.
5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint, before final installation of equipment.
6. Paint the back sides of access panels, removable or hinged covers to match the exposed surfaces.
7. Finish doors on tops, bottoms, and side edges the same as the faces, unless otherwise indicated.
8. Enamel finish applied to metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.

B. Scheduling Painting

1. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
2. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

- C. Prime Coats: Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage.
- E. "Touching-Up" of Factory Finishes: Unless otherwise specified or shown, materials with a factory finish shall not be painted at the project site. To "touch-up," the Contractor shall use the factory finished material manufacturer's recommended paint materials to repair abraded, chipped, or otherwise defective surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.7 CLEAN UP

- A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
- B. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

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SECTION 099646

INTUMESCENT COATINGS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the intumescent fireproofing on fireproofed steel exposed to view, as indicated on drawings and as specified herein, including, but not limited to, the following:
 - 1. Intumescent fireproofing.
 - 2. High-performance coating.

1.3 RELATED SECTIONS

- A. Structural steel - Section 051200.
- B. Joint sealants - Section 079200.

1.4 REFERENCES

- A. Publications listed herein are part of this specification to the extent referenced.
- B. American Society for Testing and Materials: ASTM E 119 Method for Fire Tests of Building Construction and Materials.
- C. Warnock Hersey - 2001 Certification Listings.
- D. Underwriters' Laboratories, Inc. - List of Equipment and Materials.
- E. Steel Structures Painting Council (SSPC) Surface Preparation Standards.

1.5 SYSTEM DESCRIPTION

- A. Performance Requirements: Intumescent fireproofing shall provide fire resistance compliance with requirements of the Building Code of the City of New York.
- B. Material must have B.S.A. or M.E.A. approval for use in New York City.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's literature describing product characteristics, performance, and limitation criteria, including thickness for typical shape, curing time and application sequence.

1. The Architect will choose a top coat color in a satin (low luster) finish which the manufacturer will match.
2. Submit schedule of material thickness for members to receive intumescent coating.

B. Samples

1. Submit two (2) samples of the intumescent fireproofing.
2. The manufacturer shall provide stepped samples applied to the same material as the finished installation. The first or lowest layer is the specified primer. The middle layer is the intumescent fireproofing. The top coat is an aliphatic polyurethane enamel protective top coat. The finished application will have a smooth paint-like finish.

C. Quality Assurance Submittals

1. Test Designs/Results: Submit test designs for intumescent fireproofing prepared by a nationally recognized, certified, independent testing laboratory indicating full compliance with specified fire resistance performance requirements.
2. Certificates
 - a. Provide certification that contractor/applicator utilized for application of intumescent fireproofing is approved by manufacturer.
 - b. Provide certification that specialized equipment as may be recommended by manufacturer for proper application of intumescent fireproofing shall be utilized for work of this section.
 - c. Provide certification that material has B.S.A. or M.E.A. approval for use in New York City.
3. Manufacturer's Instructions: Submit manufacturer's installation procedures which shall be basis for accepting or rejecting actual installation procedures.

1.7 QUALITY ASSURANCE

A. Qualifications

1. Applicator shall be approved by manufacturer for application of intumescent fireproofing. Applicators shall be trained and qualified in techniques and procedures for proper application and shall demonstrate a minimum of five (5) years' successful experience in such application.
2. Single Source Responsibility
 - a. Intumescent fireproofing, decorative, protective, top coat shall be products from a single manufacturer or approved for use by the manufacturer.

- b. Provide primers and other undercoat materials which are produced or are specifically recommended by manufacturer of intumescent fireproofing to ensure compatibility of system.
- B. Certifications: Intumescent fireproofing materials shall bear classification marking by Warnock Hersey, UL or other nationally recognized testing agency using ASTM standards and having a factory inspection service subject to approval of authorities having jurisdiction. Products shall be manufactured under testing agency's follow-up program.
- C. Adhesives, sealants, paints, and coatings used for work in this section shall meet the requirements of Section 018114, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants and Architectural Coatings," where applicable. Certification of these products shall be in accordance with the Submittal Requirements below.

1.8 DELIVERY, STORAGE, HANDLING

- A. Packing, Shipping, Handling, and Unloading
 - 1. Deliver products factory mixed, ready for application, in manufacturer's original unopened containers. Each container shall have manufacturer's label, intact and legible.
 - 2. Include on the label for each container:
 - a. Manufacturer's name and address.
 - b. Type of coating.
 - c. Referenced Warnock Hersey, UL or nationally certified testing laboratory design number.
 - d. Warnock Hersey, UL or national certified testing laboratory seal.
- B. Storage and Protection
 - 1. Store materials in a clean, dry, protected area. Stack containers raised off ground, using blocking or skids to provide drainage.
 - 2. Store materials at temperatures not less than 40 deg. F.
 - 3. Protect material from freezing.
 - 4. Discard materials which come in contact with contaminants or water, prior to actual use. Remove damaged materials from site.

1.9 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. Intumescent fireproofing shall not commence or proceed when steel surfaces are below 40 deg. F. or when ambient temperature is less than 40 deg. F. or expected within 24 hours.
 - 2. Relative humidity shall not exceed 80% throughout total period of application and drying of intumescent fireproofing, and shall not exceed 85% throughout

application and drying period for protective decorative finish coat, unless approved by the manufacturer prior to application.

3. Provide ventilation in areas to receive intumescent fireproofing during and for 24 hours following application to dry materials.

1.10 SEQUENCING AND SCHEDULING

- A. Schedule application of intumescent fireproofing with the General Contractor. The General Contractor shall coordinate preparation and primer application with steel fabricators along with repairs and repriming of welds.
- B. Do not apply intumescent fireproofing until concrete toppings have been installed.
- C. Sequence work in conjunction with placement of hanger tabs, mechanical component hangers, electrical devices and any other similar devices connected to members scheduled to be coated.
- D. Steel surfaces with less than 36" clear working access may necessitate application of material to inaccessible surfaces prior to erection of finished steel members, either at point of fabrication or on site.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Intumescent Fireproofing: Carboline Nullifire Series S.
 1. Interior: S606.
- B. Primer: Shop applied as specified in Structural Drawings.
- C. Protective Finish Coat: Carboline coating or approved equal.
- D. Products manufactured by Nu-Chem, Albi-Clad, and Cafco Inc. shall be considered as equivalent if surface finish, texture, thickness, and specified material characteristics comply with the conditions shown for this Project, and manufacturer can provide above certifications.

2.2 MATERIALS

- A. Intumescent Fireproofing: Solvent, thin-film fireproofing.
 1. Color: Manufacturer's standard color to be maintained for the intumescent fireproofing material without colorants or additives that will affect UL rating.
 2. Ratings: As indicated on drawings.
 3. Properties
 - a. Surface Burning Characteristics: ASTM E 84.
 - 1). Flame Spread: Less than 15.
 - 2). Smoke Developed: Less than 65.
 - b. Hardness (Shore D): D65.

- c. Impact: 67 in-pounds.
- B. Intumescent Filler Paste: As approved by manufacturer.
- C. Sealer/Primer: Provide sealer/primer tinted differently from intumescent coating and appropriate base for finish top coat.
- D. Protective Finish Top Coat
 - 1. Custom color and matte finish, as selected by Architect. Provide top coat per UL test design.
 - 2. Products
 - a. Finish Coat (Field Applied): Compatible with, and of the same manufacturer as, the primer and the intermediate coat. High-build, aliphatic polyurethane, semi-gloss (low luster) finish, one of the following:
 - 1). "Carbothane 133 HB" (Carboline Co.); 3.0 to 5.0 mils d.f.t.
 - 2). "Series 180 Endura-Shield III (A2143)" (Tnemec Co. Inc.); 4.0 mils d.f.t.
 - 3). "Imron 333" (DuPont); 3.0 to 5.0 mils d.f.t.

2.3 EQUIPMENT

- A. Spray and roller equipment shall be as recommended by intumescent coating manufacturer.
- B. Dry film thickness gage.
- C. Air movement equipment.
- D. Dehumidification equipment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions
 - 1. Examine surfaces and conditions under which intumescent fireproofing is to be applied. Report any defects which may affect the work of this Section.
 - 2. Confirm compatibility of surfaces to receive fireproofing materials prior to application of fireproofing. Steel surfaces shall be primed with a compatible primer. The primer must be approved by the intumescent fireproofing manufacturer prior to shop priming to ensure sufficient adhesion. Coordinate work with requirements for structural steel as indicated in Structural Drawings to insure proper coordination.
 - 3. Applicator shall submit in writing certifications of substitute acceptance prior to proceeding with application of fireproofing.
 - 4. Correct conditions detrimental to timely and proper execution of work.

5. Verify that all clips, hangers, sleeves and similar devices have been attached.
6. Do not proceed until unsatisfactory conditions have been corrected. Beginning application indicates acceptance of substrate surfaces.

3.2 PREPARATION

- A. Clean substrate free of dust, dirt, grease or other foreign matter which would impair bond of fire resistance materials.

3.3 PROTECTION

- A. Protect adjacent surfaces and equipment from overspray of sprayed fireproofing materials.

3.4 APPLICATION

A. Intumescent Fireproofing

1. Prior to application, allow materials to reach same temperature as surface temperature of steel by storing unopened containers in areas where application is to take place.
2. No spackle compound, gypsum basecoats, additives to intumescent paint fireproofing (other than reducers approved by the manufacturer) will be acceptable.
3. Thoroughly mix intumescent fireproofing in accordance with manufacturer's instructions and apply in sufficient thickness to achieve the fire resistance rating. Apply in as many passes as necessary to cover, with uniformed texture.
4. Apply intumescent fireproofing in strict adherence with manufacturer's instructions by spray method. Brush or roller application shall be allowed only when spray application is not practical.
5. Spray apply material using heavy duty, self-cleaning (reversible), type tip. Increase distance between tip and surface if necessary to adjust orange peel effect due to pressure. Adjust fan width accordingly.
6. Fireproofing material dries quickly, a viscosity increase may be experienced after container has been opened. Keep container covered as much as possible during application. Use recirculation feature on spray equipment at all times, especially at breaks or interruptions during spraying.
7. When applying fireproofing with roller or brush, work from small containers, mixing frequently. Original pail shall be kept tightly closed and surface of material covered with plastic sheet provided for that purpose.
8. Fireproofing materials are designed for high build with minimum number of coats; however do not exceed 40 mils per dry coat, as shrinkage may occur.
9. Follow manufacturer's recommendations for recoat times and times to finish coat.

10. Final thickness shall be measured by dry film thickness gage. Do not apply protective top coat until it has been determined that required dry film thickness of intumescent fireproofing has been provided.
11. All runs, sags, orange peel in excess of 1/32" (peak to valley), depressions shall be sanded to achieve a uniform appearance in selected high finish areas.
12. Protect base coat from running water during curing process and finish coat.

B. Protective Finish Top Coat

1. Apply protective finish top coat in strict compliance with manufacturer's instructions by spray method.
2. Spray apply material using airless spray where contained and in selected high finish areas.
3. Apply protective finish top coat in compliance with wet and dry film thickness and spreading rates as recommended by manufacturer. Thickness of protective finish coat shall not exceed 4 mils dry per coat.
4. In the event of damage or other reason a portion of a member receiving the exterior intumescent cannot be painted at the time of the final coat the entire member shall be repainted. Patches are not acceptable.
5. Drying time between coats will vary with ambient temperature and humidity conditions. Successive coats shall not be applied until previous coat is dry to touch (approximately 16 hours at 77 deg. F. and 50% relative humidity).

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing and inspecting of completed applications of intumescent material will take place in successive stages, in areas of extent and using methods as follows. Do not proceed with application of fire-resistive material for the next area until test results for previously completed applications of fire-resistive material show compliance with requirements.
 1. The intumescent coating thickness shall be measured in accordance with Technical Manual 12-B, "Standard Practice of the Testing and Inspection of Field Applied Thin-Film Intumescent Fire Resistive Materials: An Annotated Guide," published by the Association of the Wall and Ceiling Industries.
 2. When testing discovers applications of fire-resistive material not in compliance with requirements, testing and inspecting agency will perform additional random testing to determine extent of noncompliance.
- C. Remove and replace applications of intumescent material where test results indicate that they do not comply with specified requirements.

- D. Apply additional fire-resistive material per manufacturer's written instructions where test results indicate that thickness does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 102114

TOILET PARTITIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the floor anchored toilet partitions as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Gypsum board partitions - Section 092900.
- B. Ceramic tile - Section 093000.
- C. Toilet accessories - Section 102800.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to fabrication to ensure proper fitting of the work.
- B. Inserts and Anchorages: Furnish inserts and anchoring devices which must be built into other work for the installation of toilet partitions and related work. Coordinate delivery with other work to avoid delay.

1.5 SUBMITTALS

- A. Shop Drawings: Before any of the materials of this Section are delivered to the job site, submit the following:
 - 1. Room layouts and elevations for all areas, with dimensions based on actual dimensions taken at job site.
 - 2. Materials, finishes, details of construction, gauges of metal, hardware, fastening and anchoring conditions and relation to adjoining constructions.
- B. Samples: Submit the following:
 - 1. 12" x 12" sample of stainless steel finish.

2. All hardware and fitting items, including related fasteners. Include all items listed under 2.3 C. below.
- C. Templates: Submit templates to other trades as required for support of toilet partitions.

PART 2 PRODUCTS

2.1 TOILET PARTITIONS

- A. Provide floor-anchored toilet partitions as manufactured by Global Steel Products Corp., or approved equal.
- B. Manufacturer's name or identifying markings are not permitted on exposed surfaces of any metal toilet partition or vision screen, or related hardware.

2.2 URINAL SCREENS

- A. Provide wall mounted urinal screens of the types indicated, as manufactured by ASI Global, or approved equal:
- B. Manufacturer's name or identifying markings not permitted on exposed surfaces of urinal screens or related hardware.

2.3 MATERIALS FOR TOILET PARTITIONS AND SCREENS

- A. Stainless Steel Sheet: Prime quality stainless steel, cold rolled, stretcher leveled, conforming to ASTM A 666, Type 304, diamond finish unless otherwise noted.
 1. For doors, panels, pilasters and screens, provide stainless steel textured diamond finish as manufactured by Global Partitions or approved equal.
- B. Core Insulation: Manufacturer's standard rot-proof and vermin-proof double faced honeycomb core material; required in all panels, screens, pilasters and doors.
- C. Hardware: Chrome plated zinc die castings or stainless steel (Type 304), as indicated below.
 1. Pilaster Shoes: Stainless steel, one-piece (no visible joints or seams) flush or offset design, 3" high, 20 gauge.
 2. Hinges: Gravity hinge type, self-closing, concealed within door, fully adjustable, to bring door to rest at any angle. Hinge brackets cast stainless steel, with solid stainless steel pin and pintles.
 3. Latch: Chrome plated zinc die castings with solid stainless steel slide.
 4. Strike and Keeper: One piece, chrome plated zinc die castings, with rubber bumper mechanically applied and theft proof.
 5. Bumper Coat Hook: Chrome plated zinc die castings, with ferrule held rubber bumper on back of each toilet compartment door.

6. Full-Height (Continuous) Brackets: Stainless steel.
7. Hardware Finishes
 - a. On Chrome Plated Zinc Die Castings: No. 4 brushed finish.
 - b. On Stainless Steel: AISI No. 4 Satin Finish.
- D. Fasteners: Provide exposed fasteners of stainless steel or chromium plated brass, same finish as adjoining metal, theft proof. Provide concealed fasteners of non-corrosive metal.
- E. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.

2.4 FABRICATION

- A. Minimum Acceptable Metal Gauges
 1. Face Sheets for Panels, Screens and Doors: 22 gauge stainless steel sheet.
 2. Face Sheets for Pilasters: 18 gauge stainless steel sheet.
 3. Edge Moldings: 18 gauge stainless steel.
 4. Concealed Reinforcement:
 - a. For Tapping: 14 gauge galvanized steel.
 - b. For tapping Anchoring Devices: 12 gauge galvanized steel.
- B. Thicknesses
 1. Panels, Screens and Doors: One (1) inch overall thickness.
 2. Pilasters: 1-1/4" overall thickness.
- C. Sizes: As shown on drawings. Pilasters for compartments shall all be of the same width, except end pilasters which shall be approximately 1/2 the normal width.
- D. Construction: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
 1. Panels, screens, doors and pilasters shall have face sheets, with formed edges, pressure cemented to each side of core insulation, providing flat, smooth surface, free of waves, warping, buckles or other defects.
 2. Lock edges of face sheets together by either concealed tack welding face sheets at contacting edges at eight (8) inches o.c. and installing interlocking edge molding, or by using a combination integral edge molding and internal reinforcing channel epoxy bonded to face sheets.

3. Edge molding shall have corners mitered, welded or brazed, ground flush and finished to match adjacent surfaces. Corners, caps or exposed welds not permitted.
 4. Provide concealed reinforcement for hardware, grab bars, fastenings and accessories specified for in both work of this Section and in work of other Sections (such as Toilet Accessories), and for rigidity, strength and support of units in accordance with requirements of type and use of metal toilet partitions. Cut partitions in shop to receive toilet accessories, using templates furnished by Section 10800.
- E. Compartment Sizes: Unless otherwise indicated, minimum dimensions of components for toilet compartments shall be as follows:
1. Enclosure Height: 5'-10".
 2. Typical Door Width: 2'-0".
 3. Door Width for Barrier Free Compartments: 2'-10".
 4. Door Height: 4'-10".
 5. Floor Clearance: 1'-0".

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where floor mounted toilet partitions are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install work of this Section in a rigid and permanent manner, straight and plumb, with all horizontal lines level.
- B. Install panels and doors twelve (12) inches above finished floor, unless otherwise indicated. Toilet compartment doors shall be centered on water closets, unless otherwise indicated.
- C. Maintain uniform clearance of approximately 1/2" between pilasters and panels, and 1/2" between pilasters or panels and finished wall.
- D. Maintain uniform clearance of 1/4" or less between vertical edges of doors and pilasters.
- E. Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4" into structural floor unless otherwise indicated in manufacturer's written instructions. Hang doors to align tops of doors with tops of panels.

END OF SECTION

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SECTION 102800

TOILET ACCESSORIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the toilet accessories as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Mirrors.
 - 2. Soap dispensers.
 - 3. Towel dispenser
 - 4. Garbage Receptacle
 - 5. Sanitary napkin disposal units.
 - 6. Grab bars.
 - 7. Toilet tissue dispenser.
 - 8. Robe hooks.

1.3 RELATED SECTIONS

- A. Masonry - Section 042000.
- B. Gypsum board partitions - Section 092900.
- C. Ceramic tile - Section 093000.
- D. Toilet partitions - Section 102114.

1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

Accessories shall be installed at heights in compliance with prevailing Handicapped Code.

- C. Products: Unless otherwise noted, provide products of same manufacturer for each type of unit and for units exposed in same areas.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, catalogue cuts and installation instructions for each toilet accessory.
- B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices in other work
- C. Submit schedule of accessories indicating quantity and location of each item.

1.6 PRODUCT HANDLING

- A. Deliver accessories to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type or material, manufacturer's name and brand name. Delivered materials shall be identical to approved samples.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Galvanized Steel Sheet: ASTM A 653, G60.
- D. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- E. Mirrors: ASTM C 1503, mirror glazing quality, clear glass mirrors, nominal 1/4" thick.

2.2 FASTENING DEVICES

- A. Exposed Fasteners: Theftproof type, chrome plated, or stainless steel; match finishes on which they are being used.
- B. Concealed Fasteners: Galvanized (ASTM A 123) or cadmium plated.
- C. No exposed fastening devices permitted on exposed frames.
- D. For metal stud drywall partitions, provide ten (10) gauge galvanized sheet concealed anchor plates for securing surface mounted accessories.

2.3 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.
- B. Surface-Mounted Toilet Accessories, General: Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage.
- C. Recessed Toilet Accessories, General: Fabricate units of all welded construction, without mitered corners. Hang doors of access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

2.4 MANUFACTURERS

- A. Provide products manufactured by Bobrick Washroom Equipment Co., American Specialties, Inc., Bradley Corp., or approved equal.

2.5 ACCESSORY SCHEDULE

- A. Unless otherwise noted, model numbers used herein are those of Bradley or Bobrick, as noted. Other manufacturers as listed herein may substitute their products with the approval of the Architect.
- B. Accessories
 - 1. Mirrors – Model 747 (Bradley).
 - 2. Soap dispensers – Model 6437 (Bradley).
 - 3. Surface mounted paper towel dispenser – Model 2447-11 (Bradley)
 - 4. Waste receptacle – Model B-279 (Bobrick)
 - 5. Sanitary napkin disposal units – B-254 (Bobrick).
 - 6. Grab bars – B-5806 Series, satin finish (Bobrick).
 - 7. Toilet tissue dispenser – B-6867 (Bobrick).
 - 8. Single robe hook – B-6717 (Bobrick).

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where toilet accessories are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION

- A. Accessories which are to be partition mounted shall be closely coordinated with other trades, so that the necessary reinforcing is provided to receive the accessories.
- B. Furnish templates and setting drawings and anchor plates required for the proper installation of the accessories at gypsum drywall and masonry partitions. Coordinate the work to assure that base plates and anchoring frames are in the proper position to secure the accessories.
- C. Verify by measurements taken at the job site those dimensions affecting the work. Bring field dimensions which are at variance with those on the approved shop drawings to the attention of the Architect. Obtain decision regarding corrective measures before the start of fabrication of items affected.
- D. Cooperate in the coordination and scheduling of the work of this Section with the work of other Sections so as not to delay job progress.

3.3 INSTALLATION

- A. Install accessories at locations indicated on the drawings, using skilled mechanics, in a plumb, level and secure manner.
- B. Concealed anchor assemblies for gypsum drywall partitions shall be securely anchored to metal studs to accommodate accessories. Assemblies shall consist of plates and/or angles tack welded to studs.
- C. Secure accessories in place, at their designated locations by means of theftproof concealed set screws, so as to render removing of the accessory with a screwdriver impossible.
- D. Unless otherwise indicated, accessories shall conform to heights from the finished floor as shown on the drawings. Where locations are not indicated, such locations shall be as directed by the Architect.
- E. Installed accessories shall operate quietly and smoothly for use intended. Doors and operating hardware shall function without binding or unnecessary friction. Dispenser type accessories shall be keyed alike. Prior to final acceptance, master key and one duplicate key shall be given to Owner's authorized agent.
- F. The Architect shall be the sole judge of workmanship. Workmanship shall be of the highest quality. Open joints, weld marks, poor connections, etc., will not be permitted. The Architect has the right to reject any accessory if he feels the workmanship is below the standards of this project.
- G. Grab bars shall be installed so that they can support a three hundred (300) lb. load for five minutes per ASTM F 446.

3.4 CLEANING AND PROTECTION

- A. Upon completion of the installation, clean accessories of dirt, paint and foreign matter.

- B. During the installation of accessories and until finally installed and accepted, protect accessories with gummed canvas or other means in order to maintain the accessories in acceptable condition.
- C. Replace and/or repair installed work which is damaged or defective to the Owner's satisfaction, at no additional cost.

END OF SECTION

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SECTION 104000 SIGNAGE

PART 1 GENERAL

1.01 DEFINITIONS

For the purpose of this document the following definitions shall apply:

A. OWNER shall mean:

**Joseph M. Mastropietro, Assistant Commissioner, Facilities
Fire Department of City of New York
48-34 35th Street,
Long Island City, NY 11101**

B. ARCHITECT shall mean:

**Dean/Wolf Architects,
40 Hudson Street
New York, NY 10013**

C. CONTRACTOR shall mean the individual, firm or corporation executing the contract and performing the work under the terms of these Contract Documents.

D. ADHESIVE shall mean any liquid, aerosol, sheet, tape or foam tape adhesive or solvent bonding system.

E. ARTWORK shall mean reproducible artwork, in either electronic or mechanical format, to facilitate imaging of the Graphic Components of the signs.

F. CHARACTER shall mean any visual element of a sign, including letters, numerals, punctuation marks, symbols, etc.

G. COLORFILL shall mean any paint, ink, dye, varnish or other material used to fill engraved, etched, or incised characters.

H. CONTRACT DOCUMENTS shall mean all drawings, schedules, specifications and other items comprising the contract.

I. DATE OF SUBSTANTIAL COMPLETION shall mean the date upon which the work which is the subject of this contract is sufficiently complete to enable the Owner to use it for the purpose and in the manner in which it was intended.

J. GRAPHIC COMPONENTS shall mean all typography, illustrations, line drawings, maps, charts, etc. forming part of a sign.

K. PAINT shall mean any paint, ink, dye, varnish or other coating material.

L. SIGN shall mean any sign, graphic work to be applied to an architectural component, or other element described or specified in the Contract Documents.

1.02 WORK INCLUDED

A. Provide and install all work indicated in and according to all the requirements of the Contract Documents and as needed for a complete and proper Installation.

- B. The drawings are diagrammatic and for the purpose of establishing the scope, appearance and quality of the completed work. The Contractor shall be responsible for the completed sign program in its entirety and shall not take advantage of any obvious errors on the drawings or in the specifications. The Contractor shall coordinate his work with that of related trades and shall consult the Architect for clarification of any conflict which might occur.
- C. Copy, quantities and references shown on the message schedule shall have precedence over drawings. Messages should be reproduced as described in the copy column of the schedule; parenthetical information is for the fabricator's information, and describes other graphic components, such as symbols, which should be incorporated into the sign.

1.03. RELATED WORK

None specified

1.04 QUALITY ASSURANCE

- A. Field measure and survey all site conditions prior to fabrication.
- B. All work shall be constructed as complete systems, including all stiffeners, fasteners, welding, sealants, jointing, miscellaneous pieces and material thicknesses and connections required to enable the work to function properly.
- C. Confer with the Architect regarding all critical items before shop drawings are started, and advise the Architect of any significant discrepancies in field measurements or operational difficulties prior to fabrication. Obtain the Architects written approval for any resulting deviations from the specifications and/or drawings that may become necessary.
- D. Work shall be performed by competent workmen and shall be of the best quality, free from defects impairing strength, durability and appearance. All items shall be made of new materials. ,
- E. Methods of fabrication, joining, finishing and installation of all components and work shall be according to the manufacturer's instructions for the use of any products, materials, fittings and equipment used in their construction.
- F. Connections, angles, shapes and details are suggestive and are to be sized, reinforced and detailed as required for their particular application. Details not shown are to be at least equal in quality to those detailed. All details of construction are to be engineered with appropriate strength materials and finished to withstand the potential rigors of their installed locations. The Contractor shall be responsible for the structural stability of all signs and their mountings and anchorages.
- G. All work shall be uniform in detail design and finish.
- H. During the course of contract the Contractor shall provide access, during normal working hours, to the Architect to inspect all work in progress at the site of fabrication or installation.
- I. Inspection and approval of all completed and assembled work shall take place on, the Contractor's premises prior to delivery to the site and installation.
- J. Minor deviations from the specifications will be accepted to utilize a manufacturer's standard product only when, in the judgment of the Architect,

such deviations do not materially detract from the Design Concept or the intended performance.

- K. The Contractor shall be responsible for the quality of all materials and workmanship required for the execution of this contract, including the materials and workmanship of any firms or individuals who act as his subcontractors. The Contractor shall be responsible for providing subcontractors with complete and up to-date drawings, specifications, graphic schedule and other information issued by the Architect.
- L. Written dimensions on the drawings shall have precedence over scaled dimensions. In the event of conflict between written and scale dimensions, or if significant written dimensions are missing, the Contractor shall request such information from the Architect.
- M. No fabrication or installation materials or procedures shall be used that will change the visual quality or in any manner have an adverse effect on existing materials and surfaces. All damaged surfaces and materials shall be restored to their original condition and appearance by the Contractor.
- N. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

1.05. SUBMITTALS

- A. Submit three sets, unless otherwise specified, of all shop drawings, copies of camera-ready artwork and any other submissions required below to the architect for approval prior to fabrication or installation.
- B. Within 10 days of signing the contract submit a detailed schedule for both production and installation of all sign types including dates for submission and approval of all required samples, shop drawings and other submissions required under this contract. If necessary, provide separate information for separate groups of signs.
- C. Submit shop drawings showing proposed details of fabrication and installation of all components. These shall include large-scale details of construction, anchorages and accessory items.
- D. All variations from the contract documents shall be shown on the shop drawings and shall be specifically identified as such by the Contractor. All proposed variations shall equal or surpass the requirements of the originally specified items with regard to appearance, finish, material qualities, size, etc.
- E. Submit full-size Xeroxes, blackline prints or photocopies of camera-ready artwork of all graphic components. All full-size layouts and/or camera-ready art will be reviewed by the Architect for size, sharpness, alignment, accuracy of letterform, copy composition, and letter, word and line spacing.
- F. In addition to any other submissions required submit one copy only of full size templates of all sign types not to be reproduced photographically, such as individual cut letters, incised signs, neon, hand painted signs, and three dimensional signs. All such templates must accurately and clearly show, with

easily readable lines (pencil outlines are not acceptable unless the body of the character is shaded), all elements and their intended spacing.

- G. Submit two samples of each item as Indicated in the comments column of the Sign and Message schedule before manufacture of any of the final signs of any type. The samples must be installed on site or elsewhere in locations to be specified by the Architect. The Architect reserves the right to adjust final details, sizes, colors, materials and finishes to be incorporated in the production of the final signs. After inspection and approval all samples must be delivered to the Architect and will become his property. In no event shall any samples, whether approved or not, be permanently installed as part of the finished work.

1.06. OWNERSHIP MATERIALS

- A. All film reproductions prepared by the Contractor for the production of the work in this contract shall be the property of the Owner, and shall be delivered to the Owner upon request.

1.07. WARRANTY

- A. Provide a one-year warranty of materials and workmanship for all work. Should defects appear within the warranty period, the Owner shall have the right to continue use of the defective work until necessary repairs are made or until such time that it is replaced. Replacements must fulfill completion of the outstanding warranty period. The warranty period begins at the date that a letter of Substantial Completion is issued.

PART 2. PRODUCTS

2.01. GRAPHIC REQUIREMENTS

- A. Certain of the contract drawings contain non-reproducible quality copies of reproducible art. The Contractor must create and submit for approval reproducible quality art before commencing fabrication. Under no circumstances should non-reproducible copies of anything in the contract documents be used as reproducible art.
- B. The contractor shall be responsible for any and all work and/or charges associated with: translation of digital art from one format or operating system platform to another, for any image manipulation needed in order to translate digital art or templates into a format suitable for interface with the contractors software or equipment, and for image setting onto film or other media where required.
- C. All type to be set shall be exactly as specified and shall conform to all details of typefaces and suppliers. Substitutions will only be accepted, at the Architect's discretion, where they match the specified face exactly in every detail. The Contractor should be aware that in many instances certain versions of typefaces, although similarly named, may not satisfactorily match specified faces and in such - instances will not be allowed.
- D. Typesetting shall have proper letter, word and line spacing as specified and characters shall be sharp, accurately aligned on their baseline, and of consistent density,

- E. Installed work shall be accurately reproduced from the approved artwork. Characters with rounded positive or negative corners, nicked, cut or ragged edges, etc. will not be accepted. Align letterforms to maintain a baseline parallel to the overall format, unless otherwise specified. Specified margins shall be accurately maintained,
- F. Copy shown on any drawings is intended as a guideline for layout and type size only. Refer to the schedules for exact wording. Notations contained within parentheses 0 in the message schedule are instructions only and should not be included in the finished copy.
- G. The layout of the copy on the drawings and the wording indicated in the message schedule is based on scale calculations within given and estimated areas. Should any conflict arise in the final copy layout, notify the Architect before proceeding. In no event shall size, number of lines of copy or specified letter, word and/or line spacing be modified to get copy to fit.
- H. Braille shall be set as Grade 2, unless otherwise specified and shall comply with Federal Register/Vol. 56, No 144/Friday, July 26, 1991/Rules and Regulations 35687 (ADA Compliance Code). Unless otherwise specified, Braille floor numbers on elevator cab plaques shall not be preceded with the number prefix. Room numbers on door plaques shall be preceded with the number prefix. The initial cap prefix shall not be used as part of any room descriptions on plaques (i.e. the copy shall be set as though it is all lower case).
- I. Braille included on any artwork supplied by the architect is to show position and extent only. It is the Contractor's responsibility to modify the Braille, according to the Contractor's manufacturing requirements, to assure that the dot size of the finished work conforms to the ADA Compliance Code, and any other codes which apply.
- J. The manufacturer's name, trade name or trade mark shall not appear on any visible surface of any of the work. If an Underwriter's Laboratory or any other label is required to be affixed to a sign it shall be placed in an inconspicuous location.

2.02. FABRICATION

- A. The Contractor is to furnish at his own cost and expense all of the labor, materials, tools, expendable equipment and transportation services required to perform and complete the work described in the best possible and most expeditious manner according to the Contract Documents.
- B. All fabrication and installation shall be in accordance with the highest standards of the trade. All signs and components shall be complete and free from visual, structural and mechanical defects.
- C. The Contractor shall apply for and obtain, at his own expense, all permits necessary to complete the work described in the Contract Documents.
- D. All constructional, engineering and anchoring details indicated on the Architect's drawings are meant as suggestions for design intent only. The Contractor shall take full responsibility for the correct and safe engineering of all sign types and the way in which they are supported and anchored and shall submit in the shop drawings any alternative details which are necessary to result in a satisfactory and safe final product. The Contractor shall indemnify and hold harmless the

Architect against any claim resulting from failure of, or damage caused by, the installed signs.

- E. The Contractor shall take full responsibility for the effectiveness of all finishes, mechanical systems such as access doors, hinges, etc., and levels of illumination for all internally or integrally illuminated signs and shall submit in the shop drawings any alternative details which are necessary to result in a satisfactory final product. It is the Contractors responsibility to ensure that all such signs function effectively for their intended purpose under all expected environmental conditions. The Contractor shall modify or replace, at his own expense, any signs which do not function satisfactory mechanically, or which do not have effective levels of illumination.
- F. Comply with all current codes and requirements of all relevant regulatory agencies, including American National Standards Institute, Inc., A 117.1-1980 Section 4.30, the Fire Department, and any local or state fireproofing codes. Where so required, tests shall be made and certificates of conformance shall be secured at the expense of the Contractor.
- G. All exterior signage shall be weather tight.
- H. All hardware as noted on drawings shall be furnished and installed. Mechanically fastened plaques, signs and access plates shall incorporate provisions for attachment and removal as required using concealed screws or fasteners wherever possible. Visible fasteners must be vandal-proof and finished to match surrounding surface.

2.03. INSPECTION

- A. During the course of contract the Contractor shall provide access, during normal working hours, to the Architect to inspect all work in progress at the site of fabrication or installation.
- B. Inspection and approval of all completed and assembled work shall take place on the Contractor's premises prior to delivery to the site and installation.

2.04. DELIVERY, STORAGE AND HANDLING

- A. Clearly label the contents of all packages.
- B. Deliver, store and handle all packages so as to protect them from any kind of damage. Inspect all components for evidence of damage at site before installation. Damaged materials shall not be incorporated into the work and shall be removed from the site immediately.
- C. The Contractor shall replace at his own expense all work judged damaged or defective before Substantial Completion.

2.05. FABRICATION, SPECIFIC ITEMS

- A. Adhesive (Including tapes)
 - 1. Adhesives required in fabrication and installation shall be compatible with the materials to be laminated or adhered.

2. Adhesives shall be used in accordance with the recommendations of the manufacturer of the adhesives and the material to be laminated or adhered.
3. Surfaces on which adhesives are to be applied shall be smooth, clean and free of dust, dirt, grease, fingerprints or other foreign matter.
4. Adhesives shall be guaranteed not to deteriorate, discolor, delaminate or fall in adhesion for any reason including exposure to heat, sunlight, weathering or other environmental conditions.
5. Adhesives shall not change the color of, or in any way deteriorate, the materials to which they are being applied.
6. Visible joints shall be even and free from air bubbles and other defects.
7. Adhesive Foam Mounting tapes for permanent installation shall be premium quality double coated acrylic foam tape such as manufactured by 3M (VHB Tape) or approved equal. Urethane foam tapes shall not be used.
8. Unless otherwise indicated, when used for permanent installation, adhesive foam mounting tape shall be 1/16" thick and at least 112" wide. Coverage shall be at least one three inch long strip of tape at no less than six inch intervals in any direction. Mounting tape shall not be visible when the sign is viewed in its installed locations under normal conditions. No tape shall be closer than 1/8" to the edge of any component whose controlling dimension is 1" or less, or 1/4" where the dimension is 2" or less, or 1/2" where the dimension is greater than 2".
9. Silicone adhesives shall be clear, ready-to-use, high performance, premium quality materials, such as manufactured by General Electric (GE 1200), or approved equal.
10. Epoxy adhesives shall be two-component, thermal-setting, premium quality materials such as manufactured by Devcon (Two-Ton Epoxy), or approved equal.

B. Colorfill

1. Colorfill for engraved or etched metal shall consist of premium grade automobile grade lacquer with a semi gloss finish.
2. Colorfill for sandblasted masonry or-file shall consist of an even spray application of transparent light-proof ink of premium quality such as manufactured by Cleveland Lithichrome Inc. (Lithichrome), Fort Scott, Kansas, Tel: 316-223-3201.
3. Colorfill shall have accurate and clean edges, shall accurately follow the contours of the incised pattern or characters, shall be of even and consistent density over all areas required to be colorfilled, without any evidence of changing density or missed areas, and shall not have any overspill onto non-incised areas.

C. Fasteners and Hardware

1. All exposed screws shall be countersunk, unless otherwise noted.

D. Magnesium

1. Magnesium sheet and plate shall be of best architectural quality; stretcher leveled and visually flat.

E. Metal, glass or stone characters, individually water-jet or laser cut

1. Metal, glass, or stone individually cut characters, in either positive or negative form shall be cut from material of the specified material and thickness using abrasive grit water jet or laser. If necessary, all edges shall be sandblasted to remove any cutting marks and shall be smooth, free from any blemishes and shall be square to the face.
2. Where Metal, glass, or stone individually cut characters are to be mounted as extruded" or flush forms in another material, both the positive and negative forms shall be cut from the same electronic template, modified as necessary to ensure a perfect and uniform fit. The positive and negative forms shall be bonded together with epoxy adhesive. There shall be no visible residue of adhesive, or any other form of marring or staining, showing on the exposed surface of the finished work.
3. After cutting, the surfaces of the components shall be finished as specified.
4. If the metal being used is subject to oxidization and is specified as having a polished, satin, or brushed face, the entire character shall receive a protective finish of two thin coats of clear lacquer.

F. Metal, acid etched - see photo engraving

G. Metal Plaque

1. Metal plaques shall be cut from plate of the specified material and thickness. All edges shall be sanded to remove any cutting marks and shall be smooth, free from any saw marks or other blemishes and shall be square to the face.
2. After cutting, the front surfaces and sides shall be finished as specified and the entire plaque shall receive a protective coat of two thin coats of clear lacquer.
3. If the metal being used is subject to oxidization and is specified as having a polished, satin, or brushed face, the entire character shall receive a protective finish of two thin coats of clear lacquer.

H. Paint, ink and varnish

1. All colors shall be exactly reproduced as specified and shall match submitted samples. -
2. All paint shall be applied using professional spray equipment in dust-free conditions and shall be allowed to dry or cure properly before being moved.
3. Painted surfaces and other applied finishes shall have a smooth, even finish and be free of imperfections, marks, scratches, embedded dirt, wave patterns or other irregularities.
4. Paint required in fabrication, including paint for lettering, screened copy, subsurface copy, etc. shall be compatible with the materials to which it is applied and shall be guaranteed not to cause discoloration, deterioration or

delamination for any reason, including exposure to heat, sunlight, weathering or other environmental conditions.

5. Paints shall be precisely identified on the shop drawings and samples submitted.
6. Prime coats or other surface pre-treatments, where recommended by the manufacturer of the paint, shall be included in the work.

I. Photo-engraving

1. Photo engraving shall use photographic film masters to expose an appropriate acid-resist coating on the surface of metal sheet or plate as specified. The image shall then be evenly etched with acid to the depth specified on the contract drawings. After thorough washing, the engraved letters shall be colorfilled to the edges of the engraved areas.

J. Pinmounts

1. Pinmounts shall be fabricated from threaded studs permanently fixed to the component to be mounted. All studs shall be square to the face of the component.
2. Pinmounts that are to be exposed to the elements shall be of stainless steel.
3. Epoxied or welded studs shall be fabricated with no distortion or discoloration of the face of the component or any other exposed surfaces.
4. Holes drilled into plastic or wood cut component shall be fabricated with no distortion or other visible effect on face or other exposed surfaces.
5. There shall be sufficient pinmounts to adequately and safely support any component, to ensure that it lays true to the mounting surface, and to prevent it from rotating: There shall be a minimum of four studs on plaques, three studs on individual typographic characters, with the exception of the characters 1, 1, and which shall have two studs, and a minimum of one stud on punctuation marks.
6. Silicone adhesive shall be used to install pinmounts in walls or other supporting surfaces. Receiving hole shall be of sufficient size to allow positioning, and shall have clean edges and neat appearance.
7. Support components with foam tape or other mechanical means that does not damage surrounding surfaces, until permanent adhesives are set.

K. Porcelain enamel steel pans

1. Porcelain enamel steel pan signs shall be formed of 14 to 22 gauge steel sheet with 1/8" radius edges and corners. All corners shall be welded. Brazed or soldered corners shall not be used. After forming, all surfaces shall be thoroughly cleaned and etched prior to finishing.
2. At least two coats of porcelain enamel shall be applied to the steel pan. Finishes shall be free of crazing, chips, 'oil-canning', surface blemishes, or other imperfections.

3. Porcelain enamel steel pans which exceed one square foot in area shall have a rigid substrate material in the form of 3/4" exterior grade ply, or 1/4" aluminum plate, bonded to the interior face of the pan with a two-part concrete epoxy or a polyurethane adhesive, to prevent 'oil-canning' or other surface distortion.

L. Welding

1. Welding shall be accomplished using the highest standards of workmanship. All visible welded connections shall be welded along their entire length and ground flush and smooth without grinding or other finishing marks, heat discoloration or other surface differentiation or variation.

M. Zinc

1. Zinc sheet and plate shall be of best architectural quality; stretcher leveled and visually flat.

PART 3. EXECUTION

3.01. Pre-installation

- A. The location of signs shown on the drawings is for general information only. The fabricator shall arrange a meeting with the Architect and Owner at the site for final location of signs elements.
- B. The Architect shall be notified of any discrepancies in the drawings or graphic schedule, in field dimensions or conditions and/pr changes in construction drawings.
- C. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental of timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02. Installation

- A. Locate signage components where indicated on plan, in conjunction with field verification by the Architect. Installation shall be in compliance with manufacturer's instructions, unless otherwise specified.
- B. Install sign units level, plumb and at a height specified on drawings, unless otherwise indicated.
- C. Install the work in a well organized and timely manner. Whenever possible, the work shall be installed as one continuous activity. The installation process shall be coordinated to accommodate the needs of both the Owner and Architect.
- D. Inform the Architect, at least two weeks in advance, of any intended installation and shall arrange, at the Architect's convenience to have all patterns in place, and initial signs of each type ready for installation and approval by the Architect on site before proceeding with the rest of the installation. It is important that such approval processes be organized efficiently so that approvals can take place in a timely manner.
- E. Remove all existing or temporary work at the location of the installation of new signs and repair all surfaces to original condition in the case of new or recently decorated surfaces. Where surfaces are not new-or have not been recently decorated (within a period of 12 months) repair and make good all

surfaces within an area extending 12" beyond the edge of any newly installed or removed sign or any other area damaged due to the work.

- F. Follow recommendations and instructions for installation as provided by component manufacturers. Notify the architect in writing if such installation will not provide permanent, rigid installation within existing site conditions.
- G. No installation procedures or materials shall be used that will in any way change the visual quality or in any manner have an adverse effect on existing or new materials and surfaces.
- H. Protect all adjacent surfaces from damage during installation. Restore or replace any damaged surfaces to original condition and appearance.
- I. Install all signs at the locations and heights specified in the Contract Documents. All signs shall be installed level and plumb and perpendicular to the surface upon which they are mounted, unless otherwise specified.
- J. Coordinate all scheduling and installation procedures with the Owner, Architect, General Contractor and others to avoid delays or additional costs.
- K. Where appropriate, coordinate the locations of all work with existing mechanical, electrical and plumbing elements and notify Architect in writing of any visual or physical conflicts.
- L. All work shall be provided with suitable protective coverings during shipment and installation. Remove and replace protective coating for inspection when requested. Final removal of protective coatings shall take place only when there is no danger of damage from further work, and all protective coatings shall be removed simultaneously from similarly finished items to prevent uneven oxidation or discoloration.
- M. Remove packing and construction materials from the site. Leave premises broom clean and ready for work under other contracts or ready for use. Vacuum any carpets and spot clean where if necessary.
- N. Exposed surfaces of all work shall be left clean and free of glue, fingerprints, dirt, grease, dust or any other imperfections upon completion of installation.

3.06. Maintenance

- A. Before Substantial Completion, provide the Architect with one copy, and the Client with two copies of clearly written instructions for proper maintenance of all work including electrical systems. Instructions shall address periodic cleaning, service access, painting, color specifications, re-lamping, replacement procedures, etc. Provide detailed troubleshooting and "what to check" lists for all customized electrical or mechanical systems.

3.07. Project Close-out

- A. Submit two certified copies of each page of all schedules stating that installation is complete and correct prior to requesting approval of Substantial Completion.

PART 4. MESSAGE SCHEDULE

- A. Certain of the contract drawings contain non-reproducible quality copies of reproducible art held by the Architect. The Contractor must apply to the Architect for any reproducible quality art or templates which may exist before commencing fabrication. Under no circumstances should non-reproducible copies of anything in the contract documents be used as reproducible art. The contractor shall create all reproducible artwork and mechanicals necessary to complete the work.
- B. The contractor shall be responsible for any and all work and/or charges associated with: translation of digital art from one format or operating system platform to another, for any image manipulation needed in order to translate digital art or templates into a format suitable for interface with the contractor's software or equipment, and for image setting onto film or other media where required.
- C. Any information in the message column in parentheses such as (Men Symbol) is not to be included on the sign as copy, but is for information only indicating that, in this example, a "Men" Symbol is to be included on the sign.
- D. The following message schedule, while it may be considered accurate for bidding purposes, is preliminary only. Fabricator shall apply to the Owner or the architect for final message and graphics for all signs before fabrication begins.
- E. Submit two samples of each item as indicated in the comments column of the Sign and Message schedule before manufacture of any of the final signs of any type. The samples must be installed on site or elsewhere in locations to be specified by the Architect. The Architect reserves the right to adjust final details, sizes, colors, materials and finishes to be incorporated in the production of the final signs. After inspection and approval all samples must be delivered to the Architect and will become his property. In no event shall any samples, whether approved or not, be permanently installed as part of the finished work.

END OF SECTION

SECTION 104416

FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the fire extinguishers and cabinets as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Masonry walls - Section 042000.
- B. Gypsum drywall - Section 092900.
- C. Fire suppression systems - Division 22.
- D. Fire hose cabinets and valve cabinets - Division 22.

1.4 QUALITY ASSURANCE

- A. Provide portable fire extinguishers, cabinets and accessories by one manufacturer.
- B. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by Architect are required, include color charts showing full range of manufacturer's standard colors and designs available.
- B. Samples: Submit samples, 6" square, of each required finish. Prepare samples on metal of same gauge as metal to be used in the work. Where normal color variations are to be expected, include 2 or more units in each sample showing the limits of such variations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:

1. J. L. Industries.
2. Larsen's Mfg. Co.
3. Potter Roemer.

2.2 EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard which comply with requirements of governing authorities.
- B. Abbreviations indicated below to identify extinguisher type related to UL classification and rating system and not necessarily to type and amount of extinguishing material contained in extinguisher.
- C. Multi-Purpose Dry Chemical Type: UL rated 4A-6B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires, and, MP10 at Kitchen, Class K fires.

2.3 MOUNTING BRACKETS

- A. Provide manufacturer's standard bracket designed to prevent accidental dislodgment of extinguisher, of proper size for type and capacity of extinguisher specified, in manufacturer's standard enamel finish; color to match extinguisher.

2.4 CABINETS

- A. Type and Style: Fire extinguisher cabinets shall be stainless steel, recessed, with full glass panel, sized to fit within the partition or wall depth. Provide fire rated cabinets within fire rated partitions.
- B. Design is based on Architectural Series, Full Glass, Laminated Safety Glass, Model #2409-R2SS by Larsen's Mfg. Co. Other manufacturers noted herein may substitute their equivalent cabinet upon acceptance by the Architect.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where fire extinguishers and cabinets are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install items included in this Section in locations indicated and at heights to comply with applicable regulations of governing authorities.
 - 1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 - 2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
- B. Where exact location of cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by the Architect.

3.3 IDENTIFICATION

- A. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process. Provide lettering on door as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.
- B. Identify bracket-mounted extinguishers with red letter decals spelling 'FIRE EXTINGUISHER' applied to wall surface. Letter size, style and location as selected by the Architect.

3.4 SERVICE

- A. Determine the approximate completion date of the work and then inspect, charge, and tag the fire extinguishers at a date not more than 10 days before or not less than one day before actual completion date of the work.

END OF SECTION

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SECTION 105113

LOCKERS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the lockers as shown on the drawings and/or specified herein, including but not limited to, the following:
 - 1. Steel wardrobe lockers.
 - 2. Locker room benches.
 - 3. Trim, closures, anchors and accessories.

1.3 RELATED SECTIONS

- A. Concrete slab - Section 033000.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: For installation of lockers, use only personnel who are thoroughly trained and experienced in the skills involved and who are completely familiar with the manufacturer's recommended methods of installation.
- B. Uniformity: Provide each locker and bench as produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.

1.5 SUBMITTALS

- A. Shop Drawings: Before any materials of this Section are delivered to the job site, submit complete shop drawings, technical data and installation instructions to the Architect. Shop drawing must show method of installation, fillers, trim and accessories. Include locker sequencing information.
- B. Samples: Submit 6" x 6" samples of manufacturer's standard finish.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 METAL LOCKERS

- A. Manufacturers: Provide single tier 18" x 24" x 72" heavy duty all welded expanded lockers, closed base, angled top at perimeter walls and flat top at islands, as manufactured by Lyon Metal Products, or equal made by Penco Products, Republic Steel, or approved equal meeting these specifications.
- B. Sheet Steel: Mild cold-rolled and leveled steel, free from buckle, scale and surface imperfections.
- C. Fasteners: Cadmium, zinc, or nickel plated steel; exposed bolt heads, slotless type; self-locking nuts or locker washers for nuts on moving parts.
- D. Equipment: Hooks and hang rods of cadmium-plated steel or cast aluminum.

2.2 FABRICATION OF METAL LOCKERS, GENERAL

- A. Construction: Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make all exposed metal edges safe to touch. Weld, bolt or rivet other joints and connections as standard with manufacturer. Grind exposed welds flush. Do not expose bolts or rivet heads on fronts of locker doors or frames.
- B. Frames: Fabricate of 13 ga. channels or 12 ga. angles, minimum, with continuous stop/strike formed on vertical members.
- C. Finishing: Chemically pretreat metal with degreasing and phosphatizing process. Apply baked-on enamel finish to all surfaces, exposed and concealed, except plates and non-ferrous metal.
 - 1. Color: Provide locker units in color, 9016-YC. Concealed parts may be manufacturer's standard neutral color.

2.3 METAL WARDROBE LOCKERS

- A. Body: Fabricate back and sides of min. 13 ga. steel, with double-flanged connections extending full height. Form top and bottom of not less than 24 ga. steel, with flanged edges.
 - 1. Provide 24 ga. steel sheet hat shelf in single-tier units.
 - 2. Form exposed ends of non-recessed lockers of min. 13 ga. steel.
 - 3. Fabricate sides from 13 ga. Diagonal design steel mesh.
- B. Door: One-piece, all welded heavy duty 13 ga. Steel diamond mesh construction, flanged at all edges, constructed to prevent springing when opening or closing. Fabricate to swing 180 degrees unless otherwise indicated.

1. Ventilation: manufacturer's standard diamond shaped perforations in door face.
 2. Hinges: Heavy-duty, no less than 0.050" thick steel, full-loop, 5-knuckle, tight pin, 2" high. Weld to inside of frame and secure to door with not less than 2 factory-installed fasteners which are completely concealed and tamperproof when door is closed. Provide at least 3 hinges for each door.
- C. Legs: 6 inches high; formed by extending vertical frame members or fabricated from 0.075 inch nominal thickness steel sheet; welded to bottom of locker.
- D. Projecting Handle and Latch: Positive automatic, prelocking, pry-resistant latch and pull with rubber silencers; chromium-plated, heavy-duty, vandal-proof lift-up handle, containing strike and eye for padlock, and with not less than 3-point latching.

2.4 METAL LOCKER ACCESSORIES

- A. Locking: Fabricate metal lockers to receive padlock.
- B. Equipment: Furnish each locker with hat shelf, hang rod, and not less than 2 single-prong wall hooks.
- C. Number Plates: Manufacturer's standard etched, embossed, or stamped, non-ferrous metal number plates with numerals not less than 3/8" high. Number lockers in sequence as directed by Architect. Attach plates to each locker door, near top, centered, with at least 2 fasteners of same finish as number plate.
- D. Filler Panels: Provide filler panels where required of not less than 16 ga. steel sheet, factory-fabricated and finished to match locker units.

2.5 LOCKER ROOM BENCHES

- A. Lyon Heavy Duty Cast Iron Pedestal w/ hardwood top. Locker Room Benches: 9-1/2" wide by 1-1/2" thick, in lengths as indicated. Furnish cast iron pedestal supports not more than 6'-0" o.c., with provisions for concealed fastening to floor and securing to bench. Furnish all anchorages. Apply manufacturer's standard clear coating to bench tops and baked enamel finish to pedestals. Color: Signal Red 3001-3A

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where lockers are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install metal lockers at locations shown in accordance with manufacturer's instructions for plumb, level, rigid and flush installation.

- B. Space fastenings 36" o.c. and apply through back-up reinforcing plates where necessary to avoid metal distortion; conceal all fasteners.
- C. Install trim, sloping top units, and metal filler panels using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
- D. Install benches to comply with manufacturer's instructions in such a manner that they resist a 200 lb. load applied laterally to benches.

3.3 ADJUST AND CLEAN

- A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices are operating properly.
- B. Touch-up marred finishes, but replace units which cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION

SECTION 107500

FLAGPOLES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the flagpoles as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Concrete - Section 033000.

1.4 QUALITY ASSURANCE

- A. Manufacturing Standards: Provide each flagpole as a complete unit produced by a single manufacturer, including fittings, accessories, bases and anchorage devices.
- B. Design Criteria: Provide flagpoles and installations constructed to withstand a 90 mph wind velocity minimum when flying flag of appropriate size. Use heavier pipe sizes if required for flagpole type and height shown.
- C. Pole Construction: Construct pole and ship to site in one piece, if possible. If more than one piece is necessary, provide snug-fitting, precision joints with self-aligning, internal splicing sleeve arrangement for weather-tight, hairline field joints.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of flagpole required.
- B. Shop Drawings: Submit shop drawings of flagpoles and bases, showing general layout, jointing and complete anchoring and supporting systems.
- C. Samples: Submit samples of each finished metal for flagpoles, and accessories as may be required.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Spiral wrap flagpoles with heavy Kraft paper or other protective wrapping and prepare for shipment in hard fiber tube or other protective container.

- B. Deliver flagpoles and accessories completely identified for installation procedure. Handle and store flagpoles to prevent damage or soiling.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:
 - 1. Acme Flagpole, Div., Lingo Inc.
 - 2. American Flagpole, Div. of Kearney-National
 - 3. Concord Industries, Inc.
 - 4. Morgan-Francis Co.; Div., Original Tractor Cab Co.

2.2 FLAGPOLE MATERIALS

- A. Provide cone tapered aluminum flagpoles fabricated from seamless extruded tubing complying with ASTM B 241, alloy 6063-T6, having a minimum wall thickness of 3/16" (0.1875"), tensile strength not less than 35,000 psi and a yield of 30,000 psi. Heat-treat and age-harden flagpoles after fabrication.
- B. Flagpole units shall have internal halyard system conforming to the following:
 - 1. 45' exposed high, 8" butt, 4" top diameter, in wall thickness of .188, ground set.
 - 2. Finish: Clear anodized finish conforming to AA-M12C22A41, Class I (0.018 mm).
 - 3. Ball: 4" dia., seamless, aluminum, 14 ga., to match pole finish.
 - 4. Truck: Extra heavy, non-fouling, ball-bearing, revolving truck, heavy duty; finish to match pole finish.
 - 5. Winch Assembly: For raising and lowering flag, heavy duty winch assembly shall have bronze drum and hardened steel gear. Mount winch on galvanized steel frame within flagpole. Shaft of winch shall finish flush with outside face of pole through 1" (max.) diameter hole. Provide aluminum plug for winch shaft hole; plug to screw in, to finish flush with pole and to have same finish as pole. Provide removable winch handle. Provide access door in flagpole opposite winch. Access door to finish flush with pole, have same finish as pole, have concealed stainless steel hinges and lock, have stainless steel cylinder lock flush with door, and have hairline joints between door and pole.
 - 6. Halyard: Provide one concealed, continuous 3/16" min. diameter stainless steel aircraft type cable. Halyard shall run concealed within pole from winch to top of pole, and then exposed over sheave and extend down outside of pole for sufficient length to properly fit flag. Flag end of halyard shall have two white neoprene-covered bronze swivel snaps, spaced for flag size. Flag size shall be determined by

Architect. At bottom of flag end of halyard, provide rubber coated weight and Teflon-coated stainless steel rope sling around pole.

7. Foundation Tube: Provide 16 ga. min. galvanized corrugated steel tube, or 12 ga. rolled steel tube, sized to suit flagpole and installation. Furnish complete with welded steel bottom base and support plate, lightning ground spike, and steel centering wedges, all welded construction. Provide loose hardwood wedges at top for plumbing pole after erection. Galvanize steel parts after assembly, including foundation tube.
8. Base: Equal to No. 1240 made by American Flagpole, finish to match pole.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where flagpoles are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Excavation: Excavate for foundation concrete to neat clean lines in undisturbed soil. Provide forms where required due to unstable soil conditions. Remove wood, loose soil, rubbish and other foreign matter from excavation, and moisten earth before replacing concrete.
- B. Concrete: Provide concrete composed of Portland cement, coarse aggregate, fine aggregate and water, mixed in proportions to attain 28-day compressive strength of not less than 3000 psi. Use not less than 5 sacks of Portland cement, complying with ASTM C 150, per cu. yd. of wet concrete.
 1. Place concrete immediately after mixing. Perform chuting to avoid segregation of mix. Compact concrete in place by use of vibrators to consolidate.
- C. Flagpole Installation: Install flagpoles plumb and in compliance with final shop drawings and manufacturer's instructions.
 1. Provide positive lightning ground for each flagpole installation.
 2. Paint portions of ground-set flagpole below grade with heavy coat of bituminous paint.
 3. At time of erection, remove all protective wrappings.

END OF SECTION

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SECTION 112600

UNIT KITCHENS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the unit kitchens as shown on the drawings and/or specified.

1.3 RELATED SECTIONS

- A. Plumbing requirements - Division 22.
- B. Electrical requirements - Division 26.

1.4 QUALITY ASSURANCE

- A. Certification Labels: Provide unit kitchens with electrical components which bear UL labels.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions and template drawings for each type of unit kitchen, including data indicating compliance with requirements. Include operating and maintenance instruction with each unit kitchen.
- B. Samples: Submit samples of metal finishes and colors.

1.6 DELIVERY AND STORAGE

- A. Deliver products to project site in manufacturer's undamaged protective containers.
- B. Delay delivery until spaces to receive them have been fully enclosed and utility rough-ins are completed.

1.7 SPECIFIED PRODUCT WARRANTIES

- A. Submit manufacturer's standard written one (1) year warranty for each unit kitchen including extended four (4) year warranty for refrigeration system.

PART 2 PRODUCTS

2.1 UNIT KITCHEN

- A. The unit kitchen shall be Metro Series, Model No SS099BMRD as manufactured by Dwyer Kitchens or approved equal. Finish shall be stainless steel; color as selected by the Architect from manufacturer's standards.
- B. The unit kitchen shall have the following accessory items:
 - 1. Convenience light.
 - 2. Electric outlet.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where units kitchens are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions. Securely anchor to adjacent walls and floor with concealed devices.
- B. Coordinate with other trades as necessary for proper service connections, as specified in Division 15 and 16.

3.3 ADJUST AND CLEAN

- A. Ensure that operating parts work freely and fit neatly. Adjust hardware and moving parts as necessary.
- B. Repair or replace damaged parts, dents, buckles, abrasions, or other defects affecting appearance or serviceability, so that unit kitchen are in undamaged condition at time of final acceptance.

END OF SECTION

SECTION 113100

APPLIANCES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the appliances as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Sinks and related plumbing fixtures - Plumbing trades.
- B. Electrical service - Electrical trades.

1.4 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the FTC Appliance Labeling Rule, and that qualify for the EPA/DOE ENERGY STAR product labeling program.

1.5 DELIVERY AND STORAGE

- A. Deliver products to project site in manufacturer's undamaged protective containers.
- B. Delay delivery until spaces to receive them have been fully enclosed and utility rough-ins are complete.

PART 2 PRODUCTS

2.1 APPLIANCES

- A. Refrigerator: Frigidaire PLHT219TC - 21 Cu. Ft. Top Freezer Refrigerator, or equal.
- B. Electric Range: Frigidaire GLEF369DC - 30" Electric Smoothtop Range, or equal.

- C. Microwave Oven: Frigidaire FMV156DC - 1.5. Cu. Ft. Over-Range Microwave Oven, or equal.
- D. Dishwasher: Frigidaire FDB1050REC - Precision Select 21" Built-In Dishwasher, or equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where appliances are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the original design, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.
- C. Upon completion of installation and hookup to utilities, put each operating component of each appliance through at least five (5) complete operating cycles, adjusting as needed to secure optimum operation level.
- D. Touch up scratches and abrasions to be completely invisible to the unaided eye from a distance of five (5) feet.
- E. Promptly remove from the job site all cartons and packing material associated with the work of this Section.

END OF SECTION

SECTION 120640

SCHEDULE FOR FURNISHINGS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. All furniture to be manufactured by Herman Miller as specified in the following chart or approved equal.

PART 2 SCHEDULE

2.1 CHART

Item	Mfg	Cat	Part Number	Part Description	Qty
1		GRA	PLUG4	Lock Plugs	6
2		GRA	ADT1A-24	Drum Occasional Table, Wood DIM: 24 Diameter 20H	1
			247	247 Chocolate Brown Sapele, qu	
3		GRA	ADT1A-18	Drum Occasional Table, Wood DIM: 18 Diameter 20H	1
			247	247 Chocolate Brown Sapele, qu	
4		GRA	RZR1B-3028	Tablet Runoff Desk End Panel, Belting Leather, for Fixed Runoff Desk DIM: 2.5D 30W 27.5H	6
			BL-01	BL-01 Tan	
5		GRA	RSWAR-2020	Tablet Rear Unit L Panel, Right, Wood, For Use on Left DIM: 19.5D 19.125W 27.5H	2
			247	247 Chocolate Brown Sapele, qu	
6		GRA	RSWAL-2020	Tablet Rear Unit L Panel, Left, Wood, For Use on Right DIM: 19.5D 19.125W 27.5H	4
			247	247 Chocolate Brown Sapele, qu	
7		GRA	RSMW-36	Tablet Modesty Panel, Wood Insert DIM: 2.75D 36W 14.75H	6
			247	247 Chocolate Brown Sapele, qu	
8		GRA	RF2F-7223	Tablet Tackboard, Wall Mounted 2 Piece, 2 Concealed Wire Managers DIM: 0.75D 72W 23H	6
			71625	71625 Stainless Steel	
9		GRA	RTRW4-3054	Tablet Rectangular Runoff Desk Top, Wood, For Fixed Slab End Runoff (Depth Inc Edge Overhang on Top) DIM: 30D 54W 1.5H	6
			247	247 Chocolate Brown Sapele, qu	
			E01	E01 Square	
10		GRA	RT7O-2072	Tablet Credenza or Rear Unit Top (Depth Does Not Inc Edge Overhang on Top) DIM: 19.5D 72W 1.5H	6
			247	247 Chocolate Brown Sapele, qu	
			E01	E01 Square	
11		GRA	APT3M-54144	Drum Conference Table, Rectangular, Two-Piece Top, Mitered Corners DIM: 64D 144W 29H	2
			247	247 Chocolate Brown Sapele, qu	
			E01	E01 Square Edge	
			247	247 Chocolate Brown Sapele, qu	
12		GRA	RM2W-1619-A7	Tablet Mobile Pedestal, Wood, 1B1F, Wood Top with Finger Pull DIM: 19.5D 16.125W 24.25H	6
			247	247 Chocolate Brown Sapele, qu	
			RSAC	RSAC Rectangular - Satin Chrome	
			SK	with locks - Nickel	
			VNL	VNL Black Vinyl Drawers	
13		GRA	RPDW-1620-A5	Table Pedestal, Wood, 2 Files, For Use without Back Panel, Unfinished Top and Back DIM: 19.5D 16.125W 27.5H	6
			247	247 Chocolate Brown Sapele, qu	
			RSAC	RSAC Rectangular - Satin Chrome	
			SK	with locks - Nickel	
			VNL	VNL Black Vinyl Drawers	
14		GRA	RW8V-7222-ATW	Tablet Wall Mounted Storage, Wood, 4 Doors above Project Shelves, Acrylic Dividers, Acrylic Diffuser, Wood Shelf, Task Light, Finished Top DIM: 15.625D 72W 21.5H	6
			247	247 Chocolate Brown Sapele, qu	
			ACF	ACF Frost Acrylic	
			SK	with Locks - Nickel	
			NW	NW Neutral White	
			C	C Wired Center	
			U	U For Use in USA	
			DACF	DACF Frost	

Item	Mfg	Cat	Part Number	Part Description	Qty
15	✓ HMI	HFT	FT110.3530A	+Frame,Open Base 35H 30W	2
16	✓ HMI	HFT	FT110.3536A	+Frame,Open Base 35H 36W	6
17	✓ HMI	HFT	FT110.3542A	+Frame,Open Base 35H 42W	2
18	✓ HMI	HFT	FT110.6830A	+Frame,Open Base 68H 30W	7
19	✓ HMI	HFT	FT110.6842A	+Frame,Open Base 68H 42W	1
20	✓ HMI	HFT	FT121.57	+Conn 90,Universal - for 57H frames and higher 57H	4
21	✓ HMI	HFT	FT128.35	+Connection Hardware, Frame-to-Frame 35H	2
22	✓ HMI	HFT	FT128.68	+Connection Hardware, Frame-to-Frame 68H	4
23	✓ HMI	HFT	G1331	@Cord Cleat	8
24	✓ HMI	HFT	FT112.30AP	+Frame Top Cap,Standard Painted 30W	9
			MS	+metallic silver	
25	✓ HMI	HFT	FT112.36AP	+Frame Top Cap,Standard Painted 36W	6
			MS	+metallic silver	
26	✓ HMI	HFT	FT112.42AP	+Frame Top Cap,Standard Painted 42W	3
			MS	+metallic silver	
27	✓ HMI	HFT	FT123.122NP	+Conn Cover 90-Deg, 1 Side Covered,No Base Painted 22H	4
			MS	+metallic silver	
28	✓ HMI	HFT	FT123.146AP	+Conn Cover 90-Deg, 1 Side Covered,Open Base Painted 46H	2
			MS	+metallic silver	
29	✓ HMI	HFT	FT123.322NP	+Conn Cover 90-Deg, 3 Sides Covered,No Base Painted 22H	2
			MS	+metallic silver	
30	✓ HMI	HFT	FT126.1AP	+Top Cap, Conn 90-Deg, Connects-1 Frame Top Caps Painted	2
			MS	+metallic silver	
31	✓ HMI	HFT	FT126.2BP	+Top Cap, Conn 90-Deg, Connects-2 Frame Top Caps, 180-Deg Painted	2
			MS	+metallic silver	
32	✓ HMI	HFT	FT160.46AP	+Finished End,Open Base Painted 46H	8
			MS	+metallic silver	
33	✓ HMI	HFT	FT160.68AP	+Finished End,Open Base Painted 68H	2
			MS	+metallic silver	
34	✓ HMI	HFT	FT210.2442W	@Work Surf,Sq-Edge Rectangular Vnr 24D 42W	2
			6U	@Geiger® chocolate brown sapele	
35	✓ HMI	HFT	FT210.3060W	@Work Surf,Sq-Edge Rectangular Vnr 30D 60W	6
			6U	@Geiger® chocolate brown sapele	
36	✓ HMI	HFT	FT210.3072W	@Work Surf,Sq-Edge Rectangular Vnr 30D 72W	2
			6U	@Geiger® chocolate brown sapele	

Item	Mfg	Cat	Part Number	Part Description	Qty
37	HMI	HFT	FT290.24L	+Surface Cantilever, for 20"-or 24" deep surface,lft-hnd	1
✓			MS	+metallic silver	
38	HMI	HFT	FT290.24R	+Surface Cantilever, for 20"-or 24" deep surface,rt-hnd	1
✓			MS	+metallic silver	
39	HMI	HFT	FT290.30L	+Surface Cantilever, for 30"- deep surface,lft-hnd	6
✓			MS	+metallic silver	
40	HMI	HFT	FT290.30R	+Surface Cantilever, for 30"- deep surface,rt-hnd	6
✓			MS	+metallic silver	
41	HMI	HFT	FT294.24L	+Open Support,lft-hnd, 24D	1
✓			MS	+metallic silver	
42	HMI	HFT	FT294.24R	+Open Support,rt-hnd, 24D	1
✓			MS	+metallic silver	
43	HMI	HFT	FT294.30L	+Open Support,lft-hnd, 30D	2
✓			MS	+metallic silver	
44	HMI	HFT	FT294.30R	+Open Support,rt-hnd, 30D	2
✓			MS	+metallic silver	
45	HMI	HFT	G6123.30NS	+Task Light,E.E.,No Dim,AO/Pros/Etho/Vivo,NYC 30W	14
✓			MS	+metallic silver	
46	HMI	HFT	G6123.42NS	+Task Light,E.E.,No Dim,AO/Pros/Etho/Vivo,NYC 42W	2
✓			MS	+metallic silver	
47	HMI	HFT	FT170.3030P	+Lower Tile, Painted 30H 30W	18
✓			MS	+metallic silver	
			91	+white	
48	HMI	HFT	FT170.3036P	+Lower Tile, Painted 30H 36W	12
✓			MS	+metallic silver	
			91	+white	
49	HMI	HFT	FT170.3042P	+Lower Tile, Painted 30H 42W	6
✓			MS	+metallic silver	
			91	+white	
50	HMI	HFT	FT181.1130P	+Upper Tile, Painted 11H 30W	14
✓			91	+white	
			91	+white	
51	HMI	HFT	FT181.1142P	+Upper Tile, Painted 11H 42W	2
✓			91	+white	
			91	+white	
52	HMI	HFT	FT181.2230T	+Upper Tile, Tackable Fabric 22H 30W	14
			91	+white	
			8T	crossing-Pr Cat 1	
			10	tomato	

Item	Mfg	Cat	Part Number	Part Description	Qty
53	HMI	HFT	FT181.2242T	+Upper Tile, Tackable Fabric 22H 42W	2
			91	+white	
			8T	+crossing-Pr Cat 1	
			10	+tomato	
54	HMI	HFT	FT187.1130	+Thin-Profile Stacking Window 11H 30W	2
			MS	+metallic silver	
			TR	+clear	
			91	+white	
55	HMI	HFT	FT187.1136	+Thin-Profile Stacking Window 11H 36W	6
			MS	+metallic silver	
			TR	+clear	
			91	+white	
56	HMI	HFT	FT187.1142	+Thin-Profile Stacking Window 11H 42W	2
			MS	+metallic silver	
			TR	+clear	
			91	+white	
57	HMI	HFT	FT410.130CL	@Storage Unit, Sliding Door, Vnr door w/Vert Grain, Lock 15H 30W	14
			KA	+keyed alike	
			MS	+metallic silver	
			6U	@Gelger® chocolate brown sapele	
			91	+white	
			SM	+on module	
58	HMI	HFT	FT410.142CL	@Storage Unit, Sliding Door, Vnr door w/Vert Grain, Lock 15H 42W	2
			KA	+keyed alike	
			MS	+metallic silver	
			6U	@Gelger® chocolate brown sapele	
			91	+white	
			SM	+on module	
59	HMI	HST	AD10PBFR	+Side Chr, Nonuphst Outer Back, Fire Retardant	3
			MA	+metal arms	
			HG	+glide with insert, carpet or hard floors	
			BK	+black	
			8D	+hopsak 2™-Pr Cat 2	
			16	+hopsak 2™ charcoal	
60	HMI	HST	MR123AAF	+Wk Chr, Mirra, Std-Ht, Tlt Lim/Ang, Adj Arms/Seat, Uphst TrnFlex Back	45
			AJ	+adjustable lumbar support	
			G1	+graphite	
			C7	+2 1/2" caster, black yoke, hard floors or carpet	
			ZR	+shadow	
			ZT	+shadow grey	
			3Q	+aireweave™	
			12	+aireweave™ shadow	
			8M	+latitude™-Pr Cat 3	
			14	+latitude™ true red	
61	HMI	MER	73-1516-PT	+Pencil Tray for 15W Box Dwr	8

Item	Mfg	Cat	Part Number	Part Description	Qty
62	HMI	MER	F16-1522-BBF	+Ped, Freestd Std Pull, B/B/F	8
			SS	+smooth paint on smooth steel	
			MS	+metallic silver	
			T2	+1 1/4"-high painted metal top with squared edge	
			KA	+keyed alike	
			B3	+2 1/4"-high base	
			CB	+counterweight	
			C	+standard compressor	
63	HMI	MER	F16-1522-FF	+Ped, Freestd Std Pull, F/F	2
			SS	+smooth paint on smooth steel	
			MS	+metallic silver	
			T2	+1 1/4"-high painted metal top with squared edge	
			KA	+keyed alike	
			B3	+2 1/4"-high base	
			CB	+counterweight	
			C	+standard compressor	
				Grand Total	

END OF SECTION

SECTION 122413

WINDOW SHADES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the window shades as shown on the drawings and/or specified herein, including but not limited to, the following:
 - 1. Window shades, manual operation.
 - 2. Field measurements of as-built conditions.
 - 3. Accessories and hardware required for complete installation and operation.

1.3 QUALITY ASSURANCE

- A. Provide assemblies which are complete assemblies produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings.
- B. Provide materials in colors as selected by the Architect from manufacturer's standard colors.

1.4 SUBMITTALS

- A. Shop Drawings: Submit floor layout and elevations, indicating location of all window treatments, mechanism details, type and size of each unit, type and location of controls. Shop drawings must also show seaming of shade fabric. Submit shop drawings showing details of installation and relation to adjoining construction and conditions.
- B. Samples: Submit full size sample of each shade type for Architect's acceptance.
- C. Mock-Up
 - 1. Install each type of shade assembly on one complete column bay for Architect's acceptance of installation details, workmanship and operation.
 - 2. Approved mock-up shall be used as the standard for installation of work under this Section, and no further installation work shall proceed before Architect's acceptance of the mock-up.

1.5 WARRANTY

- A. Five (5) years against defects in quality or workmanship.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect shades from damage, soiling and deterioration during transit, storage and handling to, until Owner's acceptance.

PART 2 PRODUCTS

2.1 MANUALLY OPERATED SHADES

- A. Provide manually operated shade system equal to "Mecho/5 System" made by the MechoShade Corp. or equal made by Sol-R-Veil Inc. or Kirsch Co. or approved equal conforming to standards specified herein.
- B. Shade system shall be a smooth operating chain and sprocket operated roller shade system which incorporates an adjustable slip clutch to control the rate of fall, from free running zero friction factor, to a factor of 100%. The shade may be adjusted to stop and hold at an infinite number of positions, or adjustable at any percentage of friction to control the fall rate of the shade as required. The shade position when set as a free fall system to be mechanical, by use of a chain retainer. At either setting the highest and lowest shade position will have an automatic stop to prevent overwinding or unrolling. The window shade mechanism shall have sufficient latitude to accommodate small lightweight shades, as well as large heavy shades compatible with glass sizes in the building.
- C. Shade mounting brackets shall be made of 1/8" thick sheet steel and a 7/16" welded steel shaft which shall be the axis for the entire sprocket and spring clutch assembly. Reversible for left hand or right hand operation. Wall, jamb, or ceiling mounted as required, shall be permanently installed with the mechanism concealed from view when fully assembled. Delrin cover plate shall be mechanically attached to sheet steel. Injection molded Delrin cover plate is provided for each of the brackets to conceal the metal brackets from view, provide means of attaching a fabric without exposed hardware, and guide and retain the chain gear assembly. Brackets to act as protective retainer for tube and shade assembly preventing accidental dislocation of tube and shade by vibration, rough usage. The bracket assembly to be permanently mounted to the building; shade tube and fascia are removable.
- D. SnapLoc Tube: Extruded 6063-XT6 aluminum, 1-1/2" o.d., either end of tube to engage drive system through internal extruded keyway. Tube shall be extruded with two fabric mounting channels which shall provide anti-deflection support for wide span shades. All tubes removable, interchangeable without removing the drive assembly, block resetting, or readjusting the pre-set stops. Shade tube to be self-aligning and self-leveling.
- E. SnapLoc Fabric Mounting Spline: Spline to be of extruded vinyl with symmetrical insertion locking channels and embossed fabric guide. Spline shall have sufficient capacity to hold heavy shades when spline is snapped and locked into the tube. Fabric shade shall be readily removable without removing the tube from the retainer brackets, or removing the brackets from the wall.
- F. Fabric-Guide End Cap: Delrin end cap shall have steel pin which permits up to 5/16" lateral adjustment in tube width. End cap shall have 2-1/4" o.d. fabric-guide tapered disc feature to assure alignment and protection of the shade cloth.

- G. Finishes: All exposed aluminum parts have an anodized finish. Steel parts are either nickel plated, satin finish, or have been bonderized prior to painting with a baked, enamel finish.

2.2 SHADE CLOTH

- A. Shade cloth shall be "Euro-Veil" of weave and optical properties as selected by the Architect made by Mecho-Shade or equal by other manufacturers noted herein.
 - 1. Shade cloth shall have 1" hemtube with 5/8" rebar sealed inside bottom of shade cloth.

2.3 FABRICATION

- A. The shade and the fabric shall hang flat without buckling or distortion. The edge, when trimmed, shall hang straight without curling or raveling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than +/- 1/8" in either direction due to warp distortion or weave design. All shades shall be fabricated with concealed hem weights in the hem in accordance with the manufacturer's specifications to assure a properly installed window shading system.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where window treatments are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Coordinate with the work of other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the indicated design and the installation recommendations of the manufacturer as approved by the Architect.
- C. Upon completion of the installation, put all components through at least ten (10) complete cycles of operation, adjusting as necessary to achieve optimum operation.

3.3 PROTECTION AND CLEANING

- A. Protect installed units to ensure proper operating condition, without damage or blemishes. Repair or replace damaged units as directed by the Architect.

END OF SECTION

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SECTION 124816

FOOT GRILLES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the foot grilles and frames as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Concrete recess - Section 033000.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Except as otherwise indicated, provide foot grilles, frames and accessories by a single manufacturer for entire project.

1.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide foot grilles and frames capable of withstanding the following loads and stresses:
 - 1. Uniform floor load of 300 lbf/sq. ft.
 - 2. Wheel load of 350 lb per wheel.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for foot grilles. Include methods of installation for each type of substrate.
- B. Samples: Submit samples for each type and color of exposed foot grille, frame and accessory required. Provide 12" square samples of grille materials and 12" lengths of frame members.
- C. Maintenance Data: Submit manufacturer's printed instructions for cleaning, drying, maintaining and rehandling of removable units.

1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide foot grilles of sizes shown on drawings made by Arden Architectural Specialties, Inc., Balco, Inc., Construction Specialties, or approved equal.

2.2 MATERIALS

- A. General: Provide manufacturer's standard foot-grille assemblies consisting of treads of type and profile indicated, interlocked or joined together by cross members, and with support legs (if any) and other components needed to produce a complete installation.
- B. Stainless Steel Foot Grille: ASTM A 666, Type 304. Coat surface of frame in contact with cementitious materials with manufacturer's standard protective coating.
 - 1. Surface Treads: 0.071 by 0.177 inch wire with 1/8-inch wide openings between treads.
 - 2. Support Rods: Spaced 1 inch o.c., welded to each wire.
 - 3. Mat Grating: 5/8 inch deep.
 - 4. Pit Grating: 1-1/8 deep.
 - 5. Stainless Steel Finish: No. 4, directional satin finish.
 - 6. Grille Size: As indicated on drawings.
- C. Provide manufacturer's standard frames of size and style for grille type, for permanent recessed installation in subfloor, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.
- D. Level Bed Applications: Provide manufacturer's standard, vinyl cushion support system.

2.3 FABRICATION

- A. Shop fabricate foot grilles to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each grille as a single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from normal traffic lanes.

- B. Fabricate frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where floor grids and frames are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install cast-in-place grid frames integrally with principal pour of concrete floor system. Install angle grid frames into prepared block out. Install grid frames in accordance with the manufacturer's installation instructions. Locate, align and level frame members accurately.
- B. Protection: Upon completion of frame installation and concrete work, provide temporary filler of plywood or fiberboard in grid recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project reaches substantial completion.
- C. Delay installation of grids until work on the project reaches substantial completion.
- D. Lay grids in frames to fit properly and be centered in the recess; do not adhere.

END OF SECTION

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SECTION 142400

HYDRAULIC ELEVATORS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the hydraulic elevators, as indicated on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. One hydraulic elevator with cab as shown on drawings.

1.3 RELATED SECTIONS

- A. Elevator hoistways - Section 042000.
- B. Electrical power and wiring to elevator controllers and car lights - Division 26.

1.4 DEFINITIONS

- A. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.5 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch square samples of sheet materials; and 4-inch lengths of running trim members.
- D. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical

service, including emergency generator, as shown and specified, are adequate for elevator system being provided.

- E. Maintenance Manuals: Include operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at Project closeout as specified in Division 1.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an experienced installer approved by elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Regulatory Requirements: In addition to local governing regulations, comply with applicable provisions in ASME A17.1, "Safety Code for Elevators and Escalators."
 - 1. Seismic Risk Zone: Project is located in Zone 2A.
 - 2. Accessibility Requirements: In addition to local governing regulations, comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)," Section 407 in ICC A117.1.

1.7 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.
- B. Furnish well casing and coordinate delivery with related excavation work.
- C. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders, sumps, and floor drains in pits; entrance sub-sills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

1.8 WARRANTY

- A. Special Manufacturer's Warranty: Written warranty, signed by manufacturer agreeing to repair, restore, or replace defective elevator work within specified warranty period.
 - 1. Warranty Period: 12 months from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance service by skilled employees of the elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective

components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies as used in the manufacture and installation of original equipment.

1. Perform maintenance, including emergency callback service, during normal working hours.
 2. Include 24-hour-per-day, 7-day-per-week emergency callback service.
 - a. Response Time: Two hours or less.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard yearly or other period maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide hydraulic elevators by one of the following:
1. ThyssenKrupp Elevator.
 2. Fujitec America, Inc.
 3. Montgomery KONE Inc.
 4. Otis Elevator Co.
 5. Schindler Elevator Corp.

2.2 MATERIALS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard preengineered elevator systems and as required for a complete system.
- B. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide either of the following:
1. Pump, with fan-cooled squirrel-cage induction motor, mounted on top of oil tank with vibration isolation mounts. Enclose pump in prime-painted steel enclosure lined with 1-inch thick, glass-fiber insulation board.
 2. Submersible pump, with submersible squirrel-cage induction motor, suspended inside tank from vibration isolation mounts.
 3. Provide motor with wye-delta or solid-state starting.

4. Provide variable-voltage variable-frequency motor control.
- C. Hydraulic Silencers: Provide hydraulic silencer containing pulsation-absorbing material in a blowout-proof housing at pump unit.
- D. Piping: Provide size, type, and weight piping recommended by manufacturer, and provide flexible connectors to minimize sound and vibration transmissions from power unit.
 1. Provide dielectric couplings at plunger/cylinder units.
 2. Casing for Underground Piping: PVC pipe complying with ASTM D 1785 joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.
- E. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Specification Section.
- F. Protective Cylinder Casings: PVC pipe casings complying with ASME A17.1, of sufficient size to provide not less than 1-inch clearance from cylinder, and extending above pit floor.
- G. Corrosion Protective Filler: A solventless, petroleum-based gel formulated for filling the space between hydraulic cylinders and protective casings. Filler is heavier than water, electrically non-conductive, and liquefies at approximately 150 deg F.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Diversified Enterprises; No-Ox-Id R-R #6110A.
 - b. Pacific Standard Chemical Co.; Union-Gard 160.
- H. Car Frame and Platform: Welded steel units.
- I. Guides: Provide either roller guides or sliding guides at top and bottom of car and counterweight frames. If sliding guides are used, provide guide-rail lubricators or polymer-coated, nonlubricated guides.
- J. Hydraulic Fluid: Elevator manufacturer's fire-resistant fluid with additives as needed to prevent oxidation of fluid, corrosion of cylinder and other components, and other adverse effects.
- K. Finish Materials: Provide the following materials and finishes for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated:
 1. Satin Stainless Steel: ASTM A 240/A, Type 304, with No. 4, directional satin finish. 14 ga. Door and door frame.
 - a. Surface is satin polished after rolling.
 2. Stainless-Steel Bars: ASTM A 276, Type 304, No. 4 finish.

3. Laser Cut 10 ga. Stainless steel ceiling panel w/ 1/4" red acrylic lens.
4. Plastic Laminate: High-pressure type complying with NEMA LD 3; color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range of products.

2.3 OPERATION SYSTEMS

- A. Elevators: Provide manufacturer's standard microprocessor operation system for each elevator or group of elevators as required to provide type of operation system indicated.
 1. Single Elevator: Provide "selective collective automatic operation" as defined in ASME A17.1.
 2. Multiple-Car Group: Provide "group automatic operation" as defined in ASME A17.1.
- B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators.
 1. Standby Powered Lowering: On activation of standby power, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered to a preselected floor, open their doors, and shut down. Cars that are below the preselected floor are lowered to the next lower floor, open their doors, and shut down.
 2. Loaded-Car Bypass: When car load exceeds a predetermined weight, car will respond only to car calls, not to hall calls. Predetermined weight can be adjusted.
 3. Automatic Dispatching of Loaded Car: When car load exceeds a predetermined weight, doors will begin closing.
 4. Nuisance Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.
- C. Security Features: In addition to above operational features, provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
 1. Keyswitch Feature: Car and hall push buttons are activated and deactivated by security keyswitches. Key is removable only in deactivated position.
 2. Secured Landing Feature: Allows each landing to be secured or cleared. If landing is secured, car buttons for that landing do not register a call unless landing access code is entered within a predetermined time period after landing button is pressed. When a secured landing button is pressed, a "Restricted Floor" lamp lights and remains lit until landing access code has been entered or predetermined time period has elapsed.

- a. Access codes are programmed at each car operating panel using a security keyswitch. Secured landing feature is activated and deactivated by a security keyswitch at the main landing.
3. Car-to-Lobby Feature: Feature, activated by a keyswitch at main lobby, that causes all cars in a group to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, cars complete calls registered before keyswitch activation and resume normal operation.

D. Emergency Control for Fire Department Use

1. Provide Phase I and Phase II fire emergency service per ANSI/ASME A17.1 and any other requirements in accordance with local laws and ordinances.
2. Emergency operation shall be actuated by the operation of two-position (Normal, Firemen Service) key operated switches located at the Lobby Floor.

2.4 SIGNAL EQUIPMENT

- A. General: Provide signal equipment for each elevator or group of elevators with hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements of acrylic or other permanent, non-yellowing translucent plastic.
- B. Swing-Return Car Control Stations: Provide car control stations fully recessed in hinged return panel adjacent to car door.
 1. Include call buttons for each landing served and other buttons, switches, and controls required for specified car operation.
 2. Mark buttons and switches with manufacturer's standard identification for required use or function that complies with ASME A17.1.
 3. Mount controls at heights complying with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)," ICC A117.1.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Fire Department Communication System: Provide flush-mounted cabinet in each car and required conductors in traveling cable for fire department communication system specified in Division 26 Sections.

- E. Car Position Indicator: For passenger elevator cars, provide illuminated-signal type, digital-display type, or segmented type, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
 - 1. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide hall push-button stations at each landing for each elevator or group of elevators as indicated.
 - 1. Provide units with flat stainless steel faceplate for mounting with body of unit recessed in wall.
 - 2. Provide units with direction-indicating buttons; two buttons at intermediate landings; one button at terminal landings.
- G. Hall Lanterns: Provide units with illuminated arrows, but provide single arrow at terminal landings.
 - 1. Provide units with flat stainless steel faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.
 - 2. Place lanterns above each hoistway entrance, unless otherwise indicated. Mount at a minimum of 72 inches above finished floor.
 - 3. With each lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- H. Hall Position Indicators: Provide illuminated-signal type or digital-display type, located above each hoistway entrance at ground floor. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 - 1. Integrate ground-floor hall lanterns with hall position indicators.

2.5 DOOR REOPENING DEVICES

- A. Door Edge Device: Provide retractable edge shoes on elevator entrance doors that cause doors to stop and reopen upon contacting an obstruction. Include photoelectric device with timed cutout that projects dual-light beams across car entrance at 5- and 29-inch heights; the beams, when interrupted, cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for a predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.6 ELEVATOR CAB ENCLOSURES

- A. General: Provide manufacturer's standard steel-framed car enclosures with non-removable wall panels, suspended ceiling, trim, accessories, access doors, doors, power door operators, sills, thresholds, lighting, and ventilation.
 - 1. Floor finish is stone tile as specified in Section 093000

2. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch fire-retardant-treated particleboard with [plastic-laminate panel backing complying with NEMA LD 3, Type BKV and] manufacturer's standard protective edge trim. Panels have a flame-spread rating of 25 or less, when tested according to ASTM E 84.
3. Fabricate car with recesses and cutouts for signal equipment.
4. Fabricate car door frame integrally with front wall of car.
5. Stainless-Steel Doors: Flush, hollow-metal construction, fabricated from 14 ga. stainless steel.
6. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
7. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of red acrylic over laser cut stainless steel panel or other permanent rigid plastic complying with flammability requirements.
8. Handrails: 1 1/2" o.d., 3/16" wall thickness stainless steel pipe.
9. Provide stainless steel blanket hooks and two (2) complete sets of full height, quilted fire retardant protective pads.

2.7 PASSENGER HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.
- B. Materials and Fabrication: Provide manufacturer's standards but not less than the following:
 1. Stainless-Steel Doors and Frames: Formed 14 ga. stainless-steel sheet, No. 4 finish.
 2. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
 3. Non-Shrink, Non-Metallic Grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107.

2.8 ELEVATOR CHARACTERISTICS

- | | |
|------------------------|--------------|
| A. Control | "Oildraulic" |
| B. Capacity | 2,500 lbs. |
| C. Speed | 100 fpm |
| D. Car Size – Platform | As indicated |
| E. Clear Inside | As indicated |

F. Travel	As indicated
G. Power Supply	Coordinate with Division 26
H. Machine Location	Adjacent at Lowest landing
I. Stops	As indicated
J. Openings	As indicated
K. Hoistway Doors	Single Speed Side Sliding
1. Size	3'-6" x 7'-0"

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance.

3.2 INSTALLATION

- A. Excavation for Jack: Drill excavation in each elevator pit to accommodate installation of cylinders; comply with applicable requirements in Division 2 Section "Earthwork."
 - 1. Provide waterproof well casings to retain walls of well hole.
- B. Install cylinders in protective casings. Before installing protective casing, remove water and debris from well hole or casing and provide permanent waterproof seal at bottom of well casing. Fill void space between protective casing and cylinder with corrosion-protective filler.
 - 1. Align cylinders and fill space between well casing and protective casing with fine sand.
- C. Install cylinders in well casings. Before installing cylinders, remove water and debris from well casing and provide permanent waterproof seal at bottom of casing.
- D. Install cylinders plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between protective casing and pit floor with 4 inches of non-shrink, non-metallic grout.
- E. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation,

adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

- F. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
- G. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cement fittings.
- H. Lubricate operating parts of systems as recommended by manufacturers.
- I. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- J. Leveling Tolerance: 1/4 inch, up or down, regardless of load and direction of travel.
- K. Set sills flush with finished floor surface at landing. Fill space under sill solidly with non-shrink, non-metallic grout.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use either temporary or permanent of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.

3.4 DEMONSTRATION

- A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of operational failure and other building emergencies. Train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.
- B. Make a final check of each elevator operation with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

3.5 PROTECTION

- A. Temporary Use: Do not use elevators for construction purposes unless cars are provided with temporary enclosures, either within finished cars or in place of finished cars, to protect finishes from damage.
 - 1. Provide full maintenance service by skilled, competent employees of elevator Installer for elevators used for construction purposes. Include preventive

maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Use same parts and supplies as used in the manufacture and installation of original equipment.

2. Provide protective coverings, barriers, devices, signs, and other procedures to protect elevators. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

END OF SECTION

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SECTION 210501

BASIC SPRINKLER REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

Shop Drawings – shall be as directed by the construction Manager and the DDC General Conditions.

Additional copies may be required by individual sections of these Specifications.

1.03 COORDINATION DRAWINGS

Prepare coordination drawings in accordance with Division 1 section "PROJECT COORDINATION," to a scale of 3/8"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

Indicate the proposed locations of piping, ductwork, equipment, and materials. Include the following:

Clearances for servicing and maintaining equipment and space for equipment disassembly required for periodic maintenance.

Equipment connections and support details.

Exterior wall and foundation penetrations.

Fire-rated wall and floor penetrations.

Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.04 RECORD DOCUMENTS

Prepare and provide to the Engineer, "AS-Built Drawings" in accordance with DDC standards and as directed by the construction manager.

In addition to the requirements specified in DDC General conditions, indicate the following installed conditions:

Equipment locations (exposed and concealed), dimensioned from prominent building lines.

Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.05 MAINTENANCE MANUALS

Prepare maintenance manuals in accordance with Section "PROJECT CLOSEOUT" and in according to the requirements of the DDC.

Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.

Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

Servicing instructions and lubrication charts and schedules.

1.06 DELIVERY, STORAGE, AND HANDLING

Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.01 ROUGH-IN:

Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

3.02 MECHANICAL INSTALLATIONS

General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

Coordinate mechanical systems, equipment, and materials installation with other building components.

Verify all dimensions by field measurements.

Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

Install systems, materials, and equipment level and piping, parallel and perpendicular to other building systems and components.

3.03 REFER TO DRAWING COORDINATION CHECKLIST.

Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are as Section "BASIC MECHANICAL MATERIALS AND METHODS."

Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.04 CUTTING AND PATCHING

General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:

Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

Perform cutting, fitting, and patching of mechanical equipment and materials required to:

Uncover Work to provide for installation of ill-timed Work.

Remove and replace defective Work.

Remove and replace Work not conforming to requirements of the Contract Documents.

Remove samples of installed Work as specified for testing.

Install equipment and materials in existing structures.

Upon written instructions from the Architect, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.

Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.

Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Refer to Section "DEFINITIONS AND STANDARDS" for definition of "experienced Installer."

END OF SECTION 210501

SECTION 210502

BASIC SPRINKLER MATERIALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for the following products:

- Access panels and doors.
- Joint sealers.

Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.

Coordination drawings for access panel and door locations in accordance with Division 15 Section "Basic Mechanical Requirements."

Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.

Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services and details for dust and noise control.

Coordinate sequencing with construction phasing and Owner occupancy specified in Division 1 Section "Summary of Work."

1.03 QUALITY ASSURANCE

Installer Qualifications: Engage an experienced Installer for the installation and application joint sealers, access panels, and doors.

Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the UL "Building Materials Directory" for rating shown.

Provide UL Label on each fire-rated access door.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.05 PROJECT CONDITIONS

Conditions Affecting Selective Demolition: The following project conditions apply:

Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.

Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

1.06 SEQUENCE AND SCHEDULING

Coordinate the shut-off and disconnection of utility services with the Owner and the utility company.

PART 2 - PRODUCTS

2.01 MECHANICAL EQUIPMENT NAMEPLATE DATA

Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.02 MISCELLANEOUS METALS

Steel plates, shapes, bars, and bar grating: ASTM A 36.

Cold-Formed Steel Tubing: ASTM A 500.

Hot-Rolled Steel Tubing: ASTM A 501.

Steel Pipe: ASTM A 53, Schedule 40, welded.

Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout, recommended for interior and exterior applications.

Fasteners: Zinc-coated, type, grade, and class as required.

2.03 JOINT SEALERS

General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

Colors: As selected by the Architect from manufacturer's standard colors.

Elastomeric Joint Sealers: Provide the following types:

One-part, nonacid-curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.

One-part, mildew-resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with nonporous substrates; and subject to in-service exposure to conditions of high humidity and temperature extremes.

Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to, the following:

2.04 ACCESS DOORS

Steel Access Doors and Frames: Factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces.

Frames: 16-gage steel, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, pre-cast, or cast-in-place concrete, ceramic tile, or wood paneling.

For installation in masonry, concrete, ceramic tile, or wood paneling: 1 inch-wide-exposed perimeter flange and adjustable metal masonry anchors.

For gypsum wallboard or plaster: perforated flanges with wallboard bead.

For full-bed plaster applications: galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

Flush Panel Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory-applied prime paint.

Fire-Rated Units: Insulated flush panel doors, with continuous piano hinge and self-closing mechanism.

Locking Devices: Flush, screwdriver-operated cam locks.

Locking Devices: Where indicated, provide 5-pin or 5-disc type cylinder locks, individually keyed; provide 2 keys.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Bar-Co., Inc.
J.L. Industries.
Karp Associates, Inc.
Milcor Div. Inryco, Inc.
Nystrom, Inc.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION FOR JOINT SEALERS

Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape

immediately after tooling without disturbing joint seal.

3.03 ERECTION OF METAL SUPPORTS AND ANCHORAGE

Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

Field Welding: Comply with AWS "Structural Welding Code."

Attach to substrates as required to support applied loads.

3.04 APPLICATION OF JOINT SEALERS

General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.

Comply with recommendations of ASTM C 790 for use of acrylic- emulsion joint sealants.

Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials, to fill openings around mechanical services penetrating floors and walls, to provide fire-stops with fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.05 INSTALLATION OF ACCESS DOORS

Set frames accurately in position and securely attached to supports, with face panels plumb and level in relation to adjacent finish surfaces.

Adjust hardware and panels after installation for proper operation.

END OF SECTION 210502

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SECTION 210529

SPRINKLER SUPPORTS AND ANCHORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with conditions of contract and Division 1 specification sections.

Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, location, and features for each required pipe hanger and support.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58.

Components shall have galvanized coatings where installed for piping and equipment that will not have field-applied finish.

Pipe attachments shall have nonmetallic coating or be of nonmetallic materials for electrolytic protection where attachments are in direct contact with copper tubing.

2.02 HORIZONTAL-PIPING HANGERS AND SUPPORTS:

General: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit around piping insulation with saddled or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.

Adjustable Steel Clevis Hangers: MSS Type 1. (239, 100, 260)
For copper: (354, 100 CT, CT-65)

2.03 MISCELLANEOUS MATERIALS

Steel Plates, Shapes, and Bars: ASTM A 36.

Metal Framing: provide products complying with NEMA STD ML 1.

Auxiliary Steel: provide for installation of hangers, supports, anchors, guides, etc. complying with standards of AISC Steel Handbook.

Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.

Universal Trapeze: (N.A., N.A., 46) Tubular carbon steel trapeze with reinforcing plates at each hanger rod hole.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF HANGERS AND SUPPORTS

General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with the NYC Building Code and NFPA 13. Install supports with maximum spacing as indicated. If not indicated comply with the NYC Building code and NFPA 13. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

Provide additional hanger cross bracing secured to structure to restrain lengthy hanger rods and to prevent excessive vertical and horizontal movement of piping due to internal water hammer shock or accidental external mechanical contact.

Seismic restraints: Provide seismic restraints in accordance with the details on the drawings.

Hangers for piping 2-1/2" and larger shall be provided with means of vertical adjustment.

Install building attachments within concrete or to structural steel. Hangers and attachment for piping above 2-1/2" shall load beams concentrically. Space attachments within maximum piping span length in accordance with the NYC Building Code and NFPA 13. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed;

fasten insert to forms. Where concrete with compressive strength less than 2,500 psi is indicated, install reinforcing bars through openings at top of inserts.

Welding of hanger devices to building steel, burning or drilling of building steel and/or ram setting or drilling into concrete or metal roof deck shall not be permitted without written permission of structural engineer.

Hang only from building steel, provide intermediate auxiliary steel to support hanger between steel beams. No loads shall be supported from roof deck.

Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories. Except as otherwise indicated, for exposed continuous pipe runs install hangers and supports of same type and style as installed for adjacent similar piping.

Field-Fabricated, Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.

Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.

Insulated Piping: Comply with the following installation requirements.

Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

Saddles: Install protection saddles MSS Type 39 at all hanger and support points where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

3.03 INSTALLATION OF ANCHORS

Install anchors where indicated on the Drawings and at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment. Anchors or guides in contact with copper tubing shall be copper or bronze.

Fabricate and install anchors as indicated on the Drawings and by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9.

Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.04 INSTALLATION OF PIPE ALIGNMENT GUIDES

Install pipe alignment guides on piping that adjoins expansion joints and elsewhere as indicated per manufacturer's instructions.

Anchor to building substrate or auxiliary steel.

3.05 METAL FABRICATION

Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.

Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

3.06 ADJUSTING

Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

Support Adjustment: Provide grout under supports so as to bring piping and equipment to proper level and elevations.

END OF SECTION 210529

SECTION 210548

SPRINKLER VIBRATION CONTROL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 INTENT

All equipment and piping shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflections.

All isolators and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer.

It is the intent of the seismic portion of this specification to keep all mechanical building system components in place during a seismic event.

All such systems must be installed in strict accordance with seismic codes, component manufacturers and building construction standards. Whenever a conflict occurs between the manufacturers or construction standards, the most stringent shall apply.

This specification is considered to be minimum requirements for seismic consideration and is not intended as a substitute for legislated, more stringent, national, state or local construction requirements

Any variance or non-compliance with these specification requirements shall be corrected by the contractor in an approved manner.

Seismic restraints shall be designed in accordance with seismic force levels as directed by the Structural Engineer.

1.03 WORK INCLUDED

The work in this section includes, but is not limited to the following:

Vibration isolation for piping and equipment.

Equipment isolation bases.

Seismic restraints for isolated equipment.

Seismic restraints for non-isolated equipment.

Certification of seismic restraint designs and installation supervision.

Certification of seismic attachment of housekeeping pads.

All mechanical systems. Equipment buried underground is excluded but entry of services through the foundation wall is included. Equipment referred to below is typical. (Equipment not listed is still included in this specification).

Piping

1.04 SUBMITTALS:

The manufacturer of vibration isolation and seismic restraints shall provide submittals for products as follows:

Descriptive Data:

Catalog cuts or data sheets on vibration isolators and specific restraints detailing compliance with the specification.

Detailed schedules of flexible and rigidly mounted equipment, showing vibration isolators and seismic restraints by referencing numbered descriptive drawings.

Shop Drawings:

Submit fabrication details for equipment bases including dimensions, structural member sizes and support point locations.

Provide all details of suspension and support for ceiling suspended equipment.

Where walls, floors, slabs or supplementary steel work are used for seismic restraint locations, details of acceptable attachment methods for ducts, conduit and pipe must be included and approved before the condition is accepted for installation. Restraint manufacturers submittals must include spacing, static loads and seismic loads at all attachment and support points.

Provide specific details of seismic restraints and anchors; include number, size and locations for each piece of equipment.

Seismic Certification and Analysis:

Seismic restraint calculations must be provided for all connections of equipment to the structure. Calculations must be stamped by a registered professional engineer with at least five years of seismic design experience, licensed in the state of the job location.

All restraining devices shall have a preapproval number of a recognized government agency showing maximum restraint ratings. Preapprovals based on independent testing are preferred to preapprovals based on calculations. Where preapproved devices are not available, submittals based on independent testing are preferred. Calculations (including the combining of tensile and shear loadings) to support seismic restraint designs must be stamped by a registered professional engineer with at least five years of seismic design experience and licensed in the state of the job location. Testing and calculations must include both shear and tensile loads as well as one test or analysis at 45E to the weakest mode.

Analysis must indicate calculated dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and/or welded length. All seismic restraint devices shall be designed to accept, without failure, the forces detailed in section 1.06 acting through the equipment center of gravity. Overturning moments may exceed forces at ground level.

1.05 MANUFACTURER'S RESPONSIBILITY

Manufacturer of vibration isolation and seismic control equipment shall have the following responsibilities:

- Determine vibration isolation and seismic restraint sizes and locations.
- Provide vibration isolation and seismic restraints as scheduled or specified.
- Provide calculations and materials if required for restraint of unisolated equipment.
- Provide installation instructions, drawings and trained field supervision to insure proper installation and performance.

1.06 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products, of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.

Except as otherwise indicated, obtain vibration control products from single manufacturer.

1.05 RELATED WORK

Housekeeping Pads

Housekeeping pad reinforcement and monolithic pad attachment to the structure details and design shall be prepared by the restraint vendor if not already indicated on the drawings.

Housekeeping pads shall be coordinated with restraint vendor and sized to provide a minimum edge distance of ten (10) bolt diameters all around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings. If cast-in anchors are to be used, the housekeeping pads shall be sized to accommodate the ACI requirements for bolt coverage and embedment.

Supplementary Support Steel

Contractor shall supply supplementary support steel for all equipment, piping, ductwork, etc. including roof mounted equipment, as required or specified.

Attachments

Contractor shall supply restraint attachment plates cast into housekeeping pads, concrete inserts, double sided beam clamps, etc. in accordance with the requirements of the vibration vendor's calculations.

1.06 Seismic Force Levels

Shall be as directed by the Structural Engineer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering vibration control products which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide vibration control products of one of the following:

Mason Industries, Inc. (Model numbers provided for reference)
Vibration Eliminator Co., Inc.
Or approved equal.

Vibration Isolators and Seismic Restraints.

2.02 SPECIFICATION:

1. Two layers of 3/4" thick neoprene pad consisting of 2" square waffle modules separated horizontally by a 16 gauge galvanized shim. Load distribution plates shall be used as required. Pads shall be type **Super AW** as manufactured by Mason Industries, Inc.

2. Bridge-bearing neoprene mountings shall have a minimum static deflection of 0.2" and all directional seismic capability. The mount shall consist of a ductile iron casting containing two separated and opposing molded neoprene elements. The elements shall prevent the central threaded sleeve and attachment bolt from contacting the casting during normal operation. The shock absorbing neoprene materials shall be compounded to bridge-bearing specifications. Mountings shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **BR** as manufactured by Mason Industries, Inc.

3. Sheet metal panels shall be bolted to the walls or supporting structure by assemblies consisting

of a neoprene bushing cushioned between 2 steel sleeves. The outer sleeve prevents the sheet metal from cutting into the neoprene. Enlarge panel holes as required. Neoprene elements pass over the bushing to cushion the back panel horizontally. A steel disc covers the inside neoprene element and the inner steel sleeve is elongated to act as a stop so tightening the anchor bolts does not interfere with panel isolation in 3 planes. Bushing assemblies can be applied to the ends of steel cross members where applicable. All neoprene shall be bridge bearing quality. Bushing assemblies shall be type **PB** as manufactured by Mason Industries, Inc.

4. A one piece molded bridge bearing neoprene washer/bushing. The bushing shall surround the anchor bolt and have a flat washer face to avoid metal to metal contact. Neoprene bushings shall be type **HG** as manufactured by Mason Industries, Inc.

5. Spring isolators shall be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4" neoprene acoustical friction pad between the baseplate and the support. All mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include spring diameters, deflection, compressed spring height and solid spring height. Mountings shall be type **SLF** as manufactured by Mason Industries, Inc.

6. Restrained spring mountings shall have an SLF mounting as described in Specification 5, within a rigid housing that includes vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Restraining Bolts shall have a neoprene bushing between the bolt and the housing. Limit stops shall be out of contact during normal operation. Since housings will be bolted or welded in position there must be an internal isolation pad. Housing shall be designed to resist all seismic forces. Mountings shall have Anchorage Preapproval .OPA. Number from OSHPD in the state of California certifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SLR** or **SLRS** as manufactured by Mason Industries, Inc.

7. Spring mountings as in specification 5 built into a ductile iron or steel housing to provide all directional seismic snubbing. The snubber shall be adjustable vertically and allow a maximum of 1/4" travel in all directions before contacting the resilient snubbing collars. Mountings shall have an Anchorage Preapproval .OPA. number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SSLFH** as manufactured by Mason Industries, Inc.

8. Air Springs shall be manufactured with upper and lower steel sections connected by a replaceable flexible nylon reinforced neoprene element. Air spring configuration shall be multiple bellows to achieve a maximum natural frequency of 3 Hz. Air Springs shall be designed for a burst pressure that is a minimum of three times the published maximum operating pressure. All air spring systems shall be connected to either the building control air or a supplementary air supply and equipped with three leveling valves to maintain leveling within plus or minus 1/8". Submittals shall include natural frequency, load and damping tests performed by an independent lab or acoustician. Air Springs shall be type **MT** and leveling valves type **LV** as manufactured by Mason

Industries, Inc.

9. Restrained air spring mountings shall have an MT air spring as described in Specification 8, within a rigid housing that includes vertical limit stops to prevent air spring extension when weight is removed. The housing shall serve as blocking during erection. A steel spacer shall be removed after adjustment. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the air spring so as not to interfere with the air spring action. Limit stops shall be out of contact during normal operation. Housing shall be designed to resist all seismic forces. Mountings shall be type **SLR-MT** as manufactured by Mason Industries, Inc.

10. Hangers shall consist of rigid steel frames containing minimum 1 1/4" (32mm) thick neoprene elements at the top and a steel spring with general characteristics as in specification 5 seated in a steel washer reinforced neoprene cup on the bottom. The neoprene element and the cup shall have neoprene bushings projecting through the steel box. To maintain stability the boxes shall not be articulated as clevis hangers nor the neoprene element stacked on top of the spring. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30E arc from side to side before contacting the rod bushing and short circuiting the spring. Submittals shall include a hanger drawing showing the 30E capability. Hangers shall be type **30N** as manufactured by Mason Industries, Inc.

10A. Hangers shall be as described in 10, but they shall be supplied with a combination rubber and steel rebound washer as the seismic upstop for suspended piping, ductwork, equipment and electrical cabletrays. Rubber thickness shall be a minimum of 1/4". Submittals shall include a drawing of the hanger showing the installation of the rebound washer. Hangers shall be type **RW30N** as manufactured by Mason Industries, Inc.

11. Hangers shall be as described in 10, but they shall be precompressed and locked at the rated deflection by means of a resilient seismic upstop to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a drawing of the hanger showing the 30E capability. Hangers shall be type **PC30N** as manufactured by Mason Industries, Inc.

12. Seismic Cable Restraints shall consist of galvanized steel aircraft cables sized to resist seismic loads with a minimum safety factor of two and arranged to provide all-directional restraint. Cables must be prestretched to achieve a certified minimum modulus of elasticity. Cable end connections shall be steel assemblies that swivel to final installation angle and utilize two clamping bolts to provide proper cable engagement. Cables must not be allowed to bend across sharp edges. Cable assemblies shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified load ratings. Cable assemblies shall be type **SCB** at the ceiling and at the clevis bolt, **SCBH** between the hanger rod nut and the clevis or **SCBV** if clamped to a beam, all as manufactured by Mason Industries, Inc.

13. Seismic solid braces shall consist of steel angles or channels to resist seismic loads with a minimum safety factor of 2 and arranged to provide all directional restraint. Seismic solid brace end connectors shall be steel assemblies that swivel to the final installation angle and utilize two

through bolts to provide proper attachment. Seismic solid brace assembly shall have anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified load ratings. Solid seismic brace assemblies shall be type **SSB**, **SSBS** or **SSRF** as manufactured by Mason Industries, Inc.

Note: Specifications 12 - 14 apply to trapeze as well as clevis hanger locations. At trapeze anchor locations piping must be shackled to the trapeze. Specifications apply to hanging equipment as well.

14. Steel angles, sized to prevent buckling, shall be clamped to pipe or equipment rods utilizing a minimum of three ductile iron clamps at each restraint location when required. Welding of support rods is not acceptable. Rod clamp assemblies shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Rod clamp assemblies shall be type **SRC** or **UC** as manufactured by Mason Industries, Inc.

15. Pipe clevis cross bolt braces are required in all restraint locations. They shall be special purpose preformed channels deep enough to be held in place by bolts passing over the cross bolt. Clevis cross braces shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Clevis cross brace shall be type **CCB** as manufactured by Mason Industries, Inc.

16. All-directional seismic snubbers shall consist of interlocking steel members restrained by a one-piece molded neoprene bushing of bridge bearing neoprene. Bushing shall be replaceable and a minimum of 1/4" thick. Rated loadings shall not exceed 1000 psi. A minimum air gap of 1/8" shall be incorporated in the snubber design in all directions before contact is made between the rigid and resilient surfaces. Snubber end caps shall be removable to allow inspection of internal clearances. Neoprene bushings shall be rotated to insure no short circuits exist before systems are activated. Snubbers shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Snubber shall be type **Z-1225** as manufactured by Mason Industries, Inc.

17. All directional seismic snubbers shall consist of interlocking steel members restrained by shock absorbent rubber materials compounded to bridge bearing specifications. Elastomeric materials shall be replaceable and a minimum of 3/4" thick. Rated loadings shall not exceed 1000 psi. Snubbers shall be manufactured with an air gap between hard and resilient material of not less than 1/8" nor more than 1/4". Snubbers shall be installed with factory set clearances. The capacity of the seismic snubber at 3/8" deflection shall be equal or greater than the load assigned to the mounting grouping controlled by the snubber multiplied by the applicable G force. Submittals shall include the load deflection curves up to 1/2" deflection in the x, y and z planes. Snubbers shall have an anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified horizontal and vertical load ratings. Snubbers shall be type **Z-1011** as manufactured by Mason Industries, Inc.

18. Stud wedge anchors shall be manufactured from full diameter wire, not from undersized wire that is rolled up to create the thread. The stud anchor shall also have a safety shoulder which fully supports the wedge ring under load. The stud anchors shall have an evaluation report number from the I.C.B.O Evaluation Service, Inc. verifying its allowable loads. Drill-in stud wedge anchors shall be type **SAS** as manufactured by Mason Industries, Inc.

19. Female wedge anchors are preferred in floor locations so isolators or equipment can be slid into place after the anchors are installed. Anchors shall be manufactured from full diameter wire, and shall have a safety shoulder to fully support the wedge ring under load. Female wedge anchors shall have an evaluation report number from the I.C.B.O. Evaluation Service, Inc. verifying to its allowable loads. Drill-in female wedge anchors shall be type **SAB** as manufactured by Mason Industries, Inc.

20. Vibration isolation manufacturer shall furnish integral structural steel bases. Rectangular bases are preferred for all equipment. Centrifugal refrigeration machines and pump bases may be T or L shaped where space is a problem. Pump bases for split case pump shall include supports for suction and discharge elbows. All perimeter members shall be steel beams with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14" provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1". Bases shall be type **WF** as manufactured by Mason Industries, Inc.

21. Vibration isolation manufacturer shall furnish rectangular steel concrete pouring forms for floating and inertia foundations. Bases for split case pumps shall be large enough to provide for suction and discharge elbows. Bases shall be a minimum of 1/12 of the longest dimension of the base but not less than 6". The base depth need not exceed 12" unless specifically recommended by the base manufacturer for mass or rigidity. Forms shall include minimum concrete reinforcing consisting of 1/2" bars welded in place on 6" centers running both ways in a layer 1" above the bottom. Forms shall be furnished with steel templates to hold the anchor bolts sleeves and anchors while concrete is being poured. Height saving brackets shall be employed in all mounting locations to maintain a 1" clearance below the base. Wooden formed bases leaving a concrete rather than a steel finish are not acceptable. Base shall be type **BMK** or **K** as manufactured by Mason Industries, Inc.

22. Curb mounted rooftop equipment shall be mounted on spring isolation curbs. The lower member shall consist of a sheet metal or structural steel sections containing adjustable and removable steel springs that support the upper floating section. The upper frame must provide continuous support for the equipment and must be captive so as to resiliently resist wind and seismic forces. All directional neoprene snubber bushings shall be a minimum of 1/4" thick. Steel springs shall be laterally stable and rest on 1/4" thick neoprene acoustical pads. Hardware must be plated and the springs provided with a rust resistant finish. The curbs waterproofing shall consist of a continuous flexible flashing nailed over the lower curbs waterproofing. All spring locations shall have accessibility to adjust springs. Lower curbs shall have provision for 2" of insulation. The roof curbs shall be built to seismically contain the rooftop unit. The unit must be solidly fastened to the top floating rail, and the lower section anchored to the roof structure. Curb shall have anchorage pre-approval OPA from OSHPD in the state of California attesting to the maximum certified horizontal and vertical load ratings. Curb shall be type **SRSC** or **RMSS** as manufactured by Mason Industries, Inc.

23. Flexible spherical expansion joints shall employ peroxide cured EPDM in the covers, liners and Kevlar tire cord frictioning. Any substitutions must have equal or superior physical and chemical characteristics. Solid steel rings shall be used within the raised face rubber flanged ends to prevent pullout. Flexible cable bead wire is not acceptable. Sizes 2" and larger shall have two

spheres reinforced with a ductile iron external ring between spheres. Flanges shall be split ductile iron or steel with hooked or similar interlocks. Sizes 16" to 24" may be single sphere. Sizes 6" to 12" may have threaded two piece bolted flange assemblies, one sphere and cable retention. Connectors shall be rated at 250 psi up to 170EF (77EC) with a uniform drop in allowable pressure to 215 psi (1.48MPa) at 250EF (121EC) in sizes through 14" (350mm). 16" (400mm) through 24" (600mm) single sphere minimum ratings are 180 psi (1.24MPa) at 170EF (77EC) and 150 psi (1.03MPa) at 250EF (121EC). Higher rated connectors may be used to accommodate service conditions. All expansion joints must be factory tested to 150% of rated pressure for 12 minutes before shipment. Safety factors to burst and flange pullout shall be a minimum of 3/1. Concentric reducers to the above ratings may be substituted for equal ended expansion joints.

Expansion joints shall be installed in piping gaps equal to the length of the expansion joints under pressure. Control rods need only be used in unanchored piping locations where the manufacturer determines the installation exceeds the pressure requirement without control rods. If control rods are used, they must have $\frac{1}{4}$ " (12mm) thick Neoprene washer bushings large enough in diameter to take the thrust at 1000 psi (.7 kg/mm²) maximum on the washer area.

Submittals shall include two test reports by independent consultants showing minimum reductions of 20 DB in vibration accelerations and 10 DB in sound pressure levels at typical blade passage frequencies on this or a similar product by the same manufacturer. All expansion joints shall be installed on the equipment side of the shut off valves. Expansion joints shall be type **SAFEFLEX SFDEJ, SFEJ, SFDCR** or **SFU** and Control Rods **CR** as manufactured by Mason Industries, Inc.

24. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3" and larger shall be flanged. Smaller sizes shall have male nipples. Minimum lengths shall be as tabulated:

25. All-directional acoustical pipe anchor, consisting of two sizes of steel tubing separated by a minimum 1/2" thick 60 durometer neoprene. Vertical restraint shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material should not exceed 500 psi and the design shall be balanced for equal resistance in any direction. All-directional anchors shall be type **ADA** as manufactured by Mason Industries, Inc.

26. Pipe guides shall consist of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1/2" thickness of 60 durometer neoprene. The height of the guides shall be preset with a shear pin to allow vertical motion due to pipe expansion or contraction. Shear pin shall be removable and reinsertable to allow for selection of pipe movement. Guides shall be capable of $\pm 1 \frac{5}{8}$ " motion, or to meet location requirements. Pipe guides shall be type **VSG** as manufactured by Mason Industries, Inc.

27. Split Wall Seals consist of two bolted pipe halves with minimum 3/4" thick neoprene sponge bonded to the inner faces. The seal shall be tightened around the pipe to eliminate clearance between the inner sponge face and the piping. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not already in place around the pipe prior to the construction of the building member. Seals shall project a minimum of 1" past either face of the wall. Where temperatures exceed 240EF(115EC), 10# density fiberglass may be used in lieu of the sponge. Seals shall be type **SWS** as manufactured by Mason Industries, Inc.

28. The horizontal thrust restraint shall consist of a spring element in series with a neoprene molded cup as described in specification 5 with the same deflection as specified for the mountings or hangers. The spring element shall be designed so it can be preset for thrust at the factory and adjusted in the field to allow for a maximum of 1/4" movement at start and stop. The assembly shall be furnished with 1 rod and angle brackets for attachment to both the equipment and the ductwork or the equipment and the structure. Horizontal restraints shall be attached at the centerline of thrust and symmetrical on either side of the unit. Horizontal thrust restraints shall be type **WBI/WBD** as manufactured by Mason Industries, Inc.

29. Housekeeping pad anchors shall consist of a ductile iron casting that is tapered and hexagonal, smaller at its base than at its top. The upper portion shall have holes for rebar to pass through. The anchor shall be continuously threaded from top to bottom for the attachment of soleplates. Housekeeping pad anchors shall be attached to the structural slab using a stud wedge anchor. Housekeeping pad anchors shall be type **HPA** and stud wedge anchor shall be type **SAS** both as manufactured by Mason Industries, Inc.

PART 3 - EXECUTION

3.01 General

All vibration isolators and seismic restraint systems must be installed in strict accordance with the manufacturers written instructions and all certified submittal data.

Installation of vibration isolators and seismic restraints must not cause any change of position of equipment or piping resulting in stresses or misalignment.

No rigid connections between equipment and the building structure shall be made that degrades the noise and vibration control system herein specified.

The contractor shall not install any equipment, piping, duct or conduit which makes rigid connections with the building unless isolation is not specified. "Building" includes, but is not limited to, slabs, beams, columns, studs and walls.

Coordinate work with other trades to avoid rigid contact with the building.

Any conflicts with other trades which will result in rigid contact with equipment or piping due to inadequate space or other unforeseen conditions should be brought to the architects/engineers attention prior to installation. Corrective work necessitated by conflicts after installation shall be at the responsible contractors expense.

Bring to the architects/engineers attention any discrepancies between the specifications and the field conditions or changes required due to specific equipment selection, prior to installation. Corrective work necessitated by discrepancies after installation shall be at the responsible contractors expense.

Correct, at no additional cost, all installations which are deemed defective in workmanship and

materials at the contractors expense.

Overstressing of the building structure must not occur because of overhead support of equipment. Contractor must submit loads to the structural engineer of record for approval. Generally bracing may occur from:

Flanges of structural beams.

Cast in place inserts or wedge type drill-in concrete anchors.

Specification 12 cable restraints shall be installed slightly slack to avoid short circuiting the isolated suspended equipment, piping or conduit.

Specification 12 cable assemblies are installed taut on non-isolated systems. Specification 13 seismic solid braces may be used in place of cables on rigidly attached systems only.

At locations where specification 12 or 13 restraints are located, the support rods must be braced when necessary to accept compressive loads with specification 14 braces.

At locations where specification 12 cable restraints are installed on support rods with spring isolators, the spring isolation hangers must be specification type 10A.

At all locations where specification 12 or 13 restraints are attached to pipe clevis, the clevis cross bolt must be reinforced with specification type 15 braces.

Drill-in concrete anchors for ceiling and wall installation shall be specification type 18, and specification type 19 female wedge type for floor mounted equipment.

Vibration isolation manufacturer shall furnish integral structural steel bases as required. Independent steel rails are not permitted on this project.

Where piping passes through walls, floors or ceilings the vibration isolation manufacturer shall provide specification 27 wall seals.

Locate isolation hangers as near to the overhead support structure as possible.

All fire protection piping shall be braced in accordance with NFPA 13 and 14.

All fire protection equipment is considered life safety equipment and shall be seismically restrained using the seismic force levels for life safety equipment in table 1.06-1, if higher levels are shown.

3.02 Vibration Isolation of Piping

Horizontal pipe isolation: The first four pipe hangers in the main lines near the mechanical equipment shall be as described in specification 11. Brace hanger rods with SRC clamps specification 14. Horizontal runs in all other locations throughout the building shall be isolated by hangers as described in specification 10 & 10A. Floor supported piping shall rest on isolators as

described in specification 6. Heat exchangers and expansion tanks are considered part of the piping run. The first three isolators from the isolated equipment will have the same static deflection as specified for the mountings under the connected equipment. If piping is connected to equipment located in basements and hangs from ceilings under occupied spaces the first three hangers shall have 0.75" deflection for pipe sizes up to and including 3", 1 1/2" deflection for pipe sizes up to and including 6" and 2 1/2" deflection thereafter. Hangers shall be located as close to the overhead structure as practical. Hanger locations that also have seismic restraints attached must have type RW Rebound Washers to limit uplift. Where piping connects to mechanical equipment install specification 23 expansion joints or specification 24 stainless hoses if 23 is not suitable for the service.

Riser isolation: Risers shall be suspended from specification 10A hangers or supported by specification 5 mountings, anchored with specification 25 anchors, and guided with specification 26 sliding guides. Steel springs shall be a minimum of 0.75" except in those expansion locations where additional deflection is required to limit load changes to ∇ 25% of the initial load. Submittals must include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on the building structure, spring deflection changes and seismic loads. Submittal data shall include certification that the riser system has been examined for excessive stresses and that none will exist in the proposed design.

3.03 Seismic Restraint of Piping

Seismically restrain all piping listed below. Use specification 12 cables if isolated. Specification 12 or 13 restraints may be used on un-isolated piping.

Piping located in mechanical equipment rooms that is 1 1/4" I.D. and larger.

All other piping 2 1/2" diameter and larger.

Transverse piping restraints shall be at 40' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

Longitudinal restraints shall be at 80' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

Transverse restraint for one pipe section may also act as a longitudinal restraint for a pipe section of the same size connected perpendicular to it if the restraint is installed within 24" of the elbow or TEE or combined stresses are within allowable limits at longer distances.

Hold down clamps must be used to attach pipe to all trapeze members before applying restraints in a manner similar to clevis supports.

Branch lines may not be used to restrain main lines.

Connection to the structure must be made with a non-friction connection (i.e. no "C" clamps)

Hanger locations that also have seismic restraints attached must have Specification 10A type RW Rebound Washers.

3.04 Pipe Exclusions

Piping in mechanical rooms less than 1 1/4" inside diameter.

All other piping less than 2 1/2" inside diameter.

All piping suspended by clevis hangers where the distance from the top of the pipe to the suspension point is 12" or less.

All trapezed piping where the distance from the suspension point to the trapeze member is 12" or less.

If any suspension location in the run exceeds the above, the entire run must be braced.

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SECTION 210553

SPRINKLER IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.02 DESCRIPTION OF WORK:

Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-15 sections.

Types of identification devices specified in this section include the following:

- Painted Identification Materials.
- Plastic Pipe Markers.
- Plastic Tape.
- Underground-Type Plastic Line Marker.
- Valve Tags.
- Valve Schedule Frames.
- Engraved Plastic-Laminate Signs.
- Plastic Equipment Markers.
- Plasticized Tags.

1.03 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards:

ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.04 SUBMITTALS:

Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required.

Samples: Submit samples of each color, lettering style and other graphic representation required for each identification material or system.

Schedules: Submit valve schedule for sprinkler system, typewritten and reproduced on 8-1/2" x 11" bond paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves which are intended for emergency shut-off and similar special uses, by special "flags", in margin of schedule. In addition to mounted copies, furnish extra copies for Maintenance Manuals as specified in Division 1.

Maintenance Data: Include product data and schedules in maintenance manuals.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering mechanical identification materials which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide mechanical identification materials of one of the following:

Allen Systems, Inc.
Brady (W.H.) Co.; Signmark Div.
Industrial Safety Supply Co., Inc.
Seton Name Plate Corp.

2.02 MECHANICAL IDENTIFICATION MATERIALS:

General: Provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for application, selection shall be approved by the FDNY prior to installation, provide single selection for each product category.

2.03 PAINTED IDENTIFICATION MATERIALS:

Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.

Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.

Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ANSI A13.1 for colors.

2.04 PLASTIC PIPE MARKERS:

Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid snap-on, color-coded pipe markers, complying with ANSI A13.1

Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1

Small Pipes: For external diameters less than 6"), provide full-band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:

Snap-on application of pre-tensioned semi-rigid plastic pipe marker.

Adhesive lap joint in pipe marker overlap.

Laminated or bonded application of pipe marker to pipe.

Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 3/4" wide; full circle at both ends of pipe marker, tape lapped 1-1/2".

Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance with names as shown or specified.

Lettering: Comply with piping system nomenclature as specified, scheduled or shown, and abbreviate only as necessary for each application length.

Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as a separate unit of plastic.

2.05 UNDERGROUND-TYPE PLASTIC LINE MARKER:

General: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates the type of service of buried pipe.

Provide multi-ply tape consisting of solid aluminum foil core between 2-layers of plastic tape.

2.06 VALVE TAGS:

Brass Valve Tags: Provide 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener.

Provide 1-1/2" diameter tags, except as otherwise indicated.

Provide size and shape as specified or scheduled for each piping system.

Fill tag engraving with black enamel.

Provide size, shape and color combination as specified or scheduled for each piping system.

Valve Tag Fasteners: Provide manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.

Access Panel Markers: Provide manufacturer's standard 1/16" thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve. Include 1/8" center hole to allow attachment.

2.07 VALVE SCHEDULE FRAMES:

General: For each page of valve schedule, provide glazed display frame, with screws for removable mounting on masonry walls. Provide frames of finished hardwood or extruded aluminum, with SSB-grade sheet glass.

2.08 ENGRAVED PLASTIC-LAMINATE SIGNS:

General: Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

Thickness: 1/8", except as otherwise indicated.

Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.09 PLASTIC EQUIPMENT MARKERS:

General: Provide manufacturer's standard laminated plastic, color coded equipment markers.

Conform to the following color code:

Yellow: Heating equipment and components.

Blue: Equipment and components that do not meet any of the above criteria.

For hazardous equipment, use colors and designs recommended by ANSI A13.1.

Nomenclature: Include the following, matching terminology on schedules as closely as possible:

Name and plan number.

Equipment service.

Design capacity.

Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.

Size: Provide approximate 2-1/2" x 4" markers for control devices, dampers, and valves; and 4-1/2" x 6" for equipment.

2.10 LETTERING AND GRAPHICS:

General: Coordinate names, abbreviations and other designations used in mechanical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS:

Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.02 PIPING SYSTEM IDENTIFICATION:

General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:

Plastic pipe markers, with application system as indicated under "Materials" in this section. Install on pipe insulation segment where required for hot non-insulated pipes.

Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior

non-concealed locations.

Near each valve and control device.

Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.

Near locations where pipes pass through walls or floors/ ceilings, or enter non-accessible enclosures.

At access doors, manholes and similar access points which permit view of concealed piping.

Near points of origination and termination.

Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

On piping above removable acoustical ceilings.

3.03 UNDERGROUND PIPING IDENTIFICATION:

General: During back-filling/top-soiling of each exterior underground piping systems, install continuous underground-type plastic line marker, located directly over buried line at 6" to 8" below finished grade. Where multiple small lines are buried in common trench and do not exceed overall width of 16", install single line marker. For tile fields and similar installations, mark only edge pipe lines of field.

3.04 VALVE IDENTIFICATION:

General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. List each tagged valve in valve schedule for each piping system.

Tagging Schedule: Comply with requirements of "Valve Tagging Schedule" at end of this section.

Mount valve schedule frames and schedules in machine rooms where indicated or, if not otherwise indicated, where directed by Architect/Engineer.

Where more than one major machine room is shown for project, install mounted valve schedule in each major machine room, and repeat only main valves which are to be operated in conjunction with operations of more than single machine room.

3.05 MECHANICAL EQUIPMENT IDENTIFICATION:

General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device. Provide signs for the following general categories of equipment and operational devices:

Main valves.

Pumps, and similar motor- driven units.

Optional Sign Types: Where lettering larger than 1" height is needed for proper identification, because of distance from normal location of required identification, stenciled signs may be provided in lieu of engraved plastic, at Installer's option.

Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proportionately larger lettering for greater distances. Provide secondary lettering of 2/3 to 3/4 of size of the principal lettering.

Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

Operational valves and similar minor equipment items located in non-occupied spaces (including machine rooms) may, at Installer's option, be identified by installation of plasticized tags in lieu of engraved plastic signs.

3.06 ADJUSTING AND CLEANING:

Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

Cleaning: Clean face of identification devices, and glass frames of valve charts.

3.07 EXTRA STOCK:

Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

Where stenciled markers are provided, clean and retain stencils after completion of stenciling and include used stencils in extra stock, along with required stock of stenciling paints and applicators.

END OF SECTION 210553

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SECTION 211313

SPRINKLER WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

This Section specifies wet-pipe sprinkler systems for buildings and structures.

Products specified in this Section with installation not in Contract include sprinkler cabinets with spare sprinklers and sprinkler wrenches. Deliver to the Owner's maintenance personnel.

1.02 SUBMITTALS

Product data for fire protection system components. Include the following:

- Valves.

- Piping.

- Hangers.

- Sprinklers, escutcheons, and guards. Include sprinkler flow characteristics, mounting, finish, and other data.

Sprinkler system drawings identified as "shop drawings," prepared according to NFPA 13. Submit required number of sets as requested by Construction Manager. Include system hydraulic calculations.

Test reports and certificates as described in NFPA 13. Include "Contractor's Material & Test Certificate for Aboveground Piping".

Maintenance data for each fire protection specialty specified, for inclusion in "Operating and Maintenance Manual"

1.03 QUALITY ASSURANCE

Manufacturer Qualifications: Firms whose equipment, specialties, and accessories are listed by product name and manufacturer in UL Fire Protection Equipment Directory and FM Approval Guide and that conform to other requirements indicated.

Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.

Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.

The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.

Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

Comply with requirements of authority having jurisdiction for submittals, approvals, materials, hose threads, installation, inspections, and testing.

Comply with requirements of Owner's insurance underwriter for submittals, approvals, materials, installation, inspections, and testing.

Installer's Qualifications: Firms qualified to install and alter fire protection piping, equipment, specialties, and accessories, and repair and service equipment. A qualified firm is one that is experienced (minimum of 5 previous projects similar in size and scope to this Project) in such work, familiar with precautions required, and in compliance with the requirements of the authority having jurisdiction. Submit evidence of qualifications to the Architect upon request. Refer to Division 1 Section "Reference Standards and Definitions" for definition of "Installer."

NFPA Standards: Equipment, specialties, accessories, installation, and testing complying with the following:

NFPA 13 "Standard for the Installation of Sprinkler Systems."

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Sprinklers:

Central Sprinkler Corp.
Reliable Automatic Sprinkler Co., Inc.
Viking Corp.
Or approved equal.

Grooved Couplings for Steel Piping:

Grinnell Supply Sales Co., Grinnell Corp.
Stockham Valves and Fittings, Inc.

Victaulic Company of America.
Or approved equal.

Specialty Valves and Water Motor Alarm Devices:

Central Sprinkler Corp.
Reliable Automatic Sprinkler Co., Inc.
Viking Corp.
Or approved equal.

Detector Check Valves:

Viking Corp.
Watts Regulator Co.
Central Sprinkler Corp.
Reliable Automatic Sprinkler Co., Inc.
Or approved equal

Waterflow Indicators and Supervisory Switches:

Reliable Automatic Sprinkler Co., Inc.
Victaulic Company of America.
Watts Regulator Co.

Fire Department Connections:

Elkhart Brass Mfg. Co., Inc.
Reliable Automatic Sprinkler Co., Inc.
Or approved equal.

Fire Protection Service Gate and Check Valves:

Nibco, Inc.
Stockham Valves and Fittings, Inc.
Victaulic Company of America.
Or approved equal.

2.02 PIPES AND TUBES

Refer to Part 3 Article "Sprinkler System Piping Applications" for identification of systems where pipe and fitting materials specified below are used.

Steel Pipe: ASTM A 53, Schedule 80 in sizes 2 inches and smaller and Schedule 40 in sizes 2-1-1/2 inches and larger, black and galvanized, plain and threaded ends, for welded, threaded, cut-groove, and rolled-groove joints. Note, schedule 10 thin wall piping is not acceptable.

2.03 PIPE AND TUBE FITTINGS

Steel Fittings: ASTM A 234/A 234M, seamless or welded; ASME B16.9, butt welding; or ASME B16.11, socket-welding type for welded joints.

Steel Flanges and Flanged Fittings: ASME B16.5.

Grooved-End Fittings for Steel Pipe: UL-listed and FM-approved, ASTM A 536, Grade 65-45-12 ductile iron or ASTM A 47 Grade 32510 malleable iron, with grooves or shoulders designed to accept grooved couplings.

ASTM A 795, galvanized, for dry pipe portions of system.

2.04 JOINING MATERIALS

Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.

Flanged Joints for Ductile-Iron Pipe and Ductile-Iron or Cast-Iron Fittings: AWWA C115 ductile-iron or gray-iron pipe flanges, rubber gaskets, and high-strength steel bolts and nuts.

Couplings for Grooved-End Steel Pipe and Grooved-End Ferrous Fittings: UL 213, AWWA C606, ASTM A 536 ductile-iron or ASTM A 47 malleable-iron housing, with enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design; ASTM A 183 carbon-steel bolts and nuts; and locking pin, toggle, or lugs to secure grooved pipe and fittings.

2.05 SPRINKLERS

Automatic Sprinklers: With heat-responsive element conforming to:

NFPA 13, New York City Building code, the NYC Fire Department and fire marshal.

Sprinkler types shall be as listed on the drawings with nominal 1/2-inch (12.7 mm) orifice for "Ordinary" temperature classification rating except where otherwise indicated and required by application.

Sprinkler Finishes: As directed by Architect.

2.06 VALVE APPLICATIONS

Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

Shutoff Duty: Use gate, ball, or butterfly valves.

Throttling Duty: Use globe, ball, or butterfly valves.

PART 3 – EXECUTION

3.01 GENERAL

Install "Inspector's Test Connections" in sprinkler piping, complete with shutoff valve, sized and located according to NFPA 13.

Install ball drip valves to drain piping between fire department connections and check valves, and where indicated. Drain to floor drain or outside building.

Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each riser. Include pressure gages with connection not less than 1/4 inch (7 mm) and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

3.02 EXAMINATION

Examine rough-in for piping systems to verify actual locations of piping connections prior to installation.

3.03 DELIVERY, STORAGE AND HANDLING:

Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.

Protect stored pipes and tubes. Elevate above grade and enclose with durable, waterproof wrapping. When stored inside, do not exceed structural capacity of the floor.

Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or by packaging with durable waterproof wrapping.

3.04 SPRINKLER SYSTEM PIPING APPLICATIONS

Refer to Part 2 of this Section for detailed specifications on pipe and fittings products listed below. Use pipe, tube, fittings, and joining methods according to the following applications. Piping may be joined with flanges instead of indicated joints. Use grooved-end fittings with grooved couplings that are made by the same manufacturer and that comply with listing when used together for grooved-coupling joints.

Sizes 2 Inches and Smaller: ASTM A 53, A 135, or A 795; Schedule 80 steel pipe with threaded ends, cast-iron or malleable-iron threaded fittings, and threaded joints.

Sizes 2-1/2 Inches to 4 Inches: ASTM A 53, A 135, or A 795; Schedule 40 steel pipe, mechanical pipe joints and fittings.

3.05 JOINT CONSTRUCTION

Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

Grooved-End Pipe and Grooved-End Fitting Joints: Use grooved-end fittings and grooved couplings that are made by the same manufacturer and that are listed for use together. Groove pipe and assemble joints with grooved coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

Groove Type: Cut.

Groove Type: Rolled.

Dissimilar Materials Piping Joints: Make joints using adapters compatible with both piping materials.

3.06 PIPING INSTALLATIONS

Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

Deviations from approved "working plans" for sprinkler piping require written approval from authority with jurisdiction. File written approval with the Architect prior to deviating from approved "working plans."

Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

Install sprinkler piping with drains for complete system drainage.

Hangers and Supports: Comply with NFPA 13 and the New York City Building Code.

Install hanger and support spacing and locations for steel piping joined with grooved mechanical couplings according to manufacturer's written instructions for rigid systems.

Earthquake Protection: Install piping according to NFPA 13 to protect from earthquake damage.

3.07 SPRINKLER APPLICATIONS

As indicated on the drawings.

Sprinkler Finishes: As directed by the Architect.

3.08 SPRINKLER INSTALLATIONS

Install sprinklers in patterns indicated.

3.09 FIELD QUALITY CONTROL

Perform field acceptance tests of each fire protection system.

Flush, test, and inspect sprinkler piping systems according to NFPA 13 Chapter "System Acceptance."

Replace piping system components that do not pass test procedures specified, then retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

Report test results promptly and in writing to Architect.

Report test results promptly and in writing to authority having jurisdiction when required.

3.10 CLEANING

Clean dirt and debris from sprinklers. Replace sprinklers having paint other than factory finish with new sprinklers. Cleaning and reuse of painted sprinklers is prohibited.

3.11 COMMISSIONING

Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturer, proceed as follows:

Verify that specified tests of piping are complete.

Check that damaged sprinklers and sprinklers with paint or coating not specified have been replaced with new, correct type of sprinklers.

Check that sprinklers are correct type, have correct finish and temperature ratings, and have guards where required for applications.

Fill wet-pipe sprinkler systems with water.

Coordinate with fire alarm system tests. Operate systems as required.

3.12 DEMONSTRATION

Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.

Schedule demonstration with at least 7 days' advance notice.

END OF SECTION 211313

SECTION 220501

BASIC PLUMBING REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

Shop Drawings – shall be as directed by the construction Manager and the DDC General Conditions.

Additional copies may be required by individual sections of these Specifications.

1.03 COORDINATION DRAWINGS

Prepare coordination drawings in accordance with Division 1 section "PROJECT COORDINATION," to a scale of $3/8"=1'-0"$ or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

Indicate the proposed locations of piping, ductwork, equipment, and materials. Include the following:

Clearances for installing and maintaining insulation.

Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.

Equipment connections and support details.

Exterior wall and foundation penetrations.

Fire-rated wall and floor penetrations.

Sizes and location of required concrete pads and bases.

Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings

and their relationship to other penetrations and installations.

Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.04 RECORD DOCUMENTS

Prepare and provide to the Engineer, "AS-Built Drawings" in accordance with DDC standards and as directed by the construction manager.

In addition to the requirements specified in DDC General conditions, indicate the following installed conditions:

Equipment locations (exposed and concealed), dimensioned from prominent building lines.

Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.05 MAINTENANCE MANUALS

Prepare maintenance manuals in accordance with Section "PROJECT CLOSEOUT" and in according to the requirements of the DDC.

Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.

Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

Servicing instructions and lubrication charts and schedules.

1.06 DELIVERY, STORAGE, AND HANDLING

Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

2.01 ROUGH-IN:

Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

2.02 MECHANICAL INSTALLATIONS

General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

Coordinate mechanical systems, equipment, and materials installation with other building components.

Verify all dimensions by field measurements.

Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

Install systems, materials, and equipment level and plumbing, parallel and perpendicular to other building systems and components.

2.03 REFER TO DRAWING COORDINATION CHECKLIST.

Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are as Section "BASIC MECHANICAL MATERIALS AND METHODS."

Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

2.04 CUTTING AND PATCHING

General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:

Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

Perform cutting, fitting, and patching of mechanical equipment and materials required to:

Uncover Work to provide for installation of ill-timed Work.

Remove and replace defective Work.

Remove and replace Work not conforming to requirements of the Contract Documents.

Remove samples of installed Work as specified for testing.

Install equipment and materials in existing structures.

Upon written instructions from the Architect, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.

Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.

Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Refer to Section "DEFINITIONS AND STANDARDS" for definition of "experienced Installer."

END OF SECTION 220501

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SECTION 220502

BASIC PLUMBING MATERIALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for the following products:

Access panels and doors.
Joint sealers.

Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.

Coordination drawings for access panel and door locations in accordance with Division 15 Section "Basic Mechanical Requirements."

Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.

Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services and details for dust and noise control.

Coordinate sequencing with construction phasing and Owner occupancy specified in Division 1 Section "Summary of Work."

1.03 QUALITY ASSURANCE

Installer Qualifications: Engage an experienced Installer for the installation and application joint sealers, access panels, and doors.

Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the UL "Building Materials Directory" for rating shown.

Provide UL Label on each fire-rated access door.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.05 PROJECT CONDITIONS

Conditions Affecting Selective Demolition: The following project conditions apply:

Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.

Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

1.06 SEQUENCE AND SCHEDULING

Coordinate the shut-off and disconnection of utility services with the Owner and the utility company.

PART 2 - PRODUCTS

2.01 MECHANICAL EQUIPMENT NAMEPLATE DATA

Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.02 MISCELLANEOUS METALS

Steel plates, shapes, bars, and bar grating: ASTM A 36.

Cold-Formed Steel Tubing: ASTM A 500.

Hot-Rolled Steel Tubing: ASTM A 501.

Steel Pipe: ASTM A 53, Schedule 40, welded.

Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout, recommended for interior and exterior applications.

Fasteners: Zinc-coated, type, grade, and class as required.

2.03 JOINT SEALERS

General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

Colors: As selected by the Architect from manufacturer's standard colors.

Elastomeric Joint Sealers: Provide the following types:

One-part, nonacid-curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.

One-part, mildew-resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with nonporous substrates; and subject to in-service exposure to conditions of high humidity and temperature extremes.

Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to, the following:

2.04 ACCESS DOORS

Steel Access Doors and Frames: Factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces.

Frames: 16-gage steel, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, pre-cast, or cast-in-place concrete, ceramic tile, or wood paneling.

For installation in masonry, concrete, ceramic tile, or wood paneling: 1 inch-wide-exposed perimeter flange and adjustable metal masonry anchors.

For gypsum wallboard or plaster: perforated flanges with wallboard bead.

For full-bed plaster applications: galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

Flush Panel Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory-applied prime paint.

Fire-Rated Units: Insulated flush panel doors, with continuous piano hinge and self-closing mechanism.

Locking Devices: Flush, screwdriver-operated cam locks.

Locking Devices: Where indicated, provide 5-pin or 5-disc type cylinder locks, individually keyed; provide 2 keys.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Bar-Co., Inc.
J.L. Industries.
Karp Associates, Inc.
Milcor Div. Inryco, Inc.
Nystrom, Inc.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION FOR JOINT SEALERS

Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape

immediately after tooling without disturbing joint seal.

3.03 ERECTION OF METAL SUPPORTS AND ANCHORAGE

Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

Field Welding: Comply with AWS "Structural Welding Code."

Attach to substrates as required to support applied loads.

3.04 APPLICATION OF JOINT SEALERS

General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.

Comply with recommendations of ASTM C 790 for use of acrylic- emulsion joint sealants.

Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials, to fill openings around mechanical services penetrating floors and walls, to provide fire-stops with fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.05 INSTALLATION OF ACCESS DOORS

Set frames accurately in position and securely attached to supports, with face panels plumb and level in relation to adjacent finish surfaces.

Adjust hardware and panels after installation for proper operation.

END OF SECTION 220502

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SECTION 220529

PLUMBING SUPPORTS AND ANCHORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with conditions of contract and Division 1 specification sections.

Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, location, and features for each required pipe hanger and support.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with NYC Building code.

Components shall have galvanized coatings where installed for piping and equipment that will not have field-applied finish.

Pipe attachments shall have nonmetallic coating or be of nonmetallic materials for electrolytic protection where attachments are in direct contact with copper tubing.

2.02 HORIZONTAL-PIPING HANGERS AND SUPPORTS:

General: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with the NYC Building Code and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit around piping insulation with saddled or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.

Adjustable Steel Clevis Hangers: MSS Type 1. (239, 100, 260)
For copper: (354, 100 CT, CT-65)

2.03 MISCELLANEOUS MATERIALS

Steel Plates, Shapes, and Bars: ASTM A 36.

Metal Framing: provide products complying with NEMA STD ML 1.

Auxiliary Steel: provide for installation of hangers, supports, anchors, guides, etc. complying with standards of AISC Steel Handbook.

Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.

Universal Trapeze: (N.A., N.A., 46) Tubular carbon steel trapeze with reinforcing plates at each hanger rod hole.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF HANGERS AND SUPPORTS

General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with NYC Building Code. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible. Install supports with maximum spacing to comply with NYC Building Code. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

Provide additional hanger cross bracing secured to structure to restrain lengthy hanger rods and to prevent excessive vertical and horizontal movement of piping due to internal water hammer shock or accidental external mechanical contact.

Provide electrolysis in support of copper tubing by use of hangers and supports which are copper plated.

Hangers for piping 2-1/2" and larger shall be provided with means of vertical adjustment.

Install building attachments within concrete or to structural steel. Hangers and attachment for piping above 2-1/2" shall load beams concentrically. Space attachments within maximum piping span length as indicated. If not indicated, comply with NYC Building Code. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed;

fasten insert to forms. Where concrete with compressive strength less than 2,500 psi is indicated, install reinforcing bars through openings at top of inserts.

Welding of hanger devices to building steel, burning or drilling of building steel and/or ram setting or drilling into concrete or metal roof deck shall not be permitted without written permission of structural engineer.

Hang only from building steel, provide intermediate auxiliary steel to support hanger between steel beams. No loads shall be supported from roof deck.

Piping shall be supported resiliently by using combination spring and neoprene element hangers in the following locations:

Within the Mechanical Equipment Room or within 50 feet of the vibrating equipment, whichever is greater.

Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories. Except as otherwise indicated, for exposed continuous pipe runs install hangers and supports of same type and style as installed for adjacent similar piping.

Field-Fabricated, Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.

Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.

Insulated Piping: Comply with the following installation requirements.

Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

Saddles: Install protection saddles MSS Type 39 at all hanger and support points where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

3.03 INSTALLATION OF ANCHORS

Install anchors where indicated on the Drawings and at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses

to connected equipment. Anchors or guides in contact with copper tubing shall be copper or bronze.

Fabricate and install anchors as indicated on the Drawings and by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9.

Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.04 INSTALLATION OF PIPE ALIGNMENT GUIDES

Install pipe alignment guides on piping that adjoins expansion joints and elsewhere as indicated per manufacturer's instructions.

Anchor to building substrate or auxiliary steel.

3.05 EQUIPMENT SUPPORTS

Concrete housekeeping bases will be provided as work of Division 3. Furnish to Contractor, scaled layouts of all required bases, with dimensions of bases, and locations to column center lines. Furnish templates, anchor bolts, and accessories, necessary for base construction.

Furnish roof equipment supports to Contractor for installation as part of work of Division 7; not work of this section.

Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.

Grouting: Place grout under supports for piping and equipment.

3.06 METAL FABRICATION

Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.

Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

3.07 ADJUSTING

Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

Support Adjustment: Provide grout under supports so as to bring piping and equipment to proper level and elevations.

END OF SECTION 220529

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SECTION 220548

PLUMBING VIBRATION CONTROL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 INTENT

All equipment and piping shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflections.

All isolators and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer.

It is the intent of the seismic portion of this specification to keep all mechanical building system components in place during a seismic event.

All such systems must be installed in strict accordance with seismic codes, component manufacturers and building construction standards. Whenever a conflict occurs between the manufacturers or construction standards, the most stringent shall apply.

This specification is considered to be minimum requirements for seismic consideration and is not intended as a substitute for legislated, more stringent, national, state or local construction requirements

Any variance or non-compliance with these specification requirements shall be corrected by the contractor in an approved manner.

Seismic restraints shall be designed in accordance with seismic force levels as directed by the Structural Engineer.

1.03 WORK INCLUDED

The work in this section includes, but is not limited to the following:

Vibration isolation for piping and equipment.

Equipment isolation bases.

Flexible piping connections.

Seismic restraints for isolated equipment.

Seismic restraints for non-isolated equipment.

Certification of seismic restraint designs and installation supervision.

Certification of seismic attachment of housekeeping pads.

All mechanical systems. Equipment buried underground is excluded but entry of services through the foundation wall is included. Equipment referred to below is typical. (Equipment not listed is still included in this specification).

Piping
Water Heaters

1.04 SUBMITTALS:

The manufacturer of vibration isolation and seismic restraints shall provide submittals for products as follows:

Descriptive Data:

Catalog cuts or data sheets on vibration isolators and specific restraints detailing compliance with the specification.

Detailed schedules of flexible and rigidly mounted equipment, showing vibration isolators and seismic restraints by referencing numbered descriptive drawings.

Shop Drawings:

Submit fabrication details for equipment bases including dimensions, structural member sizes and support point locations.

Provide all details of suspension and support for ceiling suspended equipment.

Where walls, floors, slabs or supplementary steel work are used for seismic restraint locations, details of acceptable attachment methods for pipes must be included and approved before the condition is accepted for installation. Restraint manufacturers submittals must include spacing, static loads and seismic loads at all attachment and support points.

Provide specific details of seismic restraints and anchors; include number, size and locations for each piece of equipment.

Seismic Certification and Analysis:

Seismic restraint calculations must be provided for all connections of equipment to the structure. Calculations must be stamped by a registered professional engineer with at least five years of seismic design experience, licensed in the state of the job location.

All restraining devices shall have a preapproval number of a recognized government agency showing maximum restraint ratings. Preapprovals based on independent testing are preferred to preapprovals based on calculations. Where preapproved devices are not available, submittals based on independent testing are preferred. Calculations (including the combining of tensile and shear loadings) to support seismic restraint designs must be stamped by a registered professional engineer with at least five years of seismic design experience and licensed in the state of the job location. Testing and calculations must include both shear and tensile loads as well as one test or analysis at 45E to the weakest mode.

Analysis must indicate calculated dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and/or welded length. All seismic restraint devices shall be designed to accept, without failure, the forces detailed in section 1.06 acting through the equipment center of gravity. Overturning moments may exceed forces at ground level.

1.05 MANUFACTURER'S RESPONSIBILITY

Manufacturer of vibration isolation and seismic control equipment shall have the following responsibilities:

- Determine vibration isolation and seismic restraint sizes and locations.
- Provide vibration isolation and seismic restraints as scheduled or specified.
- Provide calculations and materials if required for restraint of unisolated equipment.
- Provide installation instructions, drawings and trained field supervision to insure proper installation and performance.

1.06 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products, of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.

Except as otherwise indicated, obtain vibration control products from single manufacturer.

1.05 RELATED WORK

Housekeeping Pads

Housekeeping pad reinforcement and monolithic pad attachment to the structure details and design shall be prepared by the restraint vendor if not already indicated on the drawings.

Housekeeping pads shall be coordinated with restraint vendor and sized to provide a

minimum edge distance of ten (10) bolt diameters all around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings. If cast-in anchors are to be used, the housekeeping pads shall be sized to accommodate the ACI requirements for bolt coverage and embedment.

Supplementary Support Steel

Contractor shall supply supplementary support steel for all equipment, piping, ductwork, etc. including roof mounted equipment, as required or specified.

Attachments

Contractor shall supply restraint attachment plates cast into housekeeping pads, concrete inserts, double sided beam clamps, etc. in accordance with the requirements of the vibration vendor's calculations.

1.06 Seismic Force Levels

Shall be as directed by the Structural Engineer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering vibration control products which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide vibration control products of one of the following:

Mason Industries, Inc. (Model numbers provided for reference)
Vibration Eliminator Co., Inc.
Or approved equal.

Vibration Isolators and Seismic Restraints.

2.02 SPECIFICATION:

1. Two layers of 3/4" thick neoprene pad consisting of 2" square waffle modules separated horizontally by a 16 gauge galvanized shim. Load distribution plates shall be used as required. Pads shall be type **Super AW®** as manufactured by Mason Industries, Inc.

2. Bridge-bearing neoprene mountings shall have a minimum static deflection of 0.2" and all directional seismic capability. The mount shall consist of a ductile iron casting containing two

separated and opposing molded neoprene elements. The elements shall prevent the central threaded sleeve and attachment bolt from contacting the casting during normal operation. The shock absorbing neoprene materials shall be compounded to bridge-bearing specifications. Mountings shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **BR** as manufactured by Mason Industries, Inc.

3. Sheet metal panels shall be bolted to the walls or supporting structure by assemblies consisting of a neoprene bushing cushioned between 2 steel sleeves. The outer sleeve prevents the sheet metal from cutting into the neoprene. Enlarge panel holes as required. Neoprene elements pass over the bushing to cushion the back panel horizontally. A steel disc covers the inside neoprene element and the inner steel sleeve is elongated to act as a stop so tightening the anchor bolts does not interfere with panel isolation in 3 planes. Bushing assemblies can be applied to the ends of steel cross members where applicable. All neoprene shall be bridge bearing quality. Bushing assemblies shall be type **PB** as manufactured by Mason Industries, Inc.

4. A one piece molded bridge bearing neoprene washer/bushing. The bushing shall surround the anchor bolt and have a flat washer face to avoid metal to metal contact. Neoprene bushings shall be type **HG** as manufactured by Mason Industries, Inc.

5. Spring isolators shall be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4" neoprene acoustical friction pad between the baseplate and the support. All mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include spring diameters, deflection, compressed spring height and solid spring height. Mountings shall be type **SLF** as manufactured by Mason Industries, Inc.

6. Restrained spring mountings shall have an SLF mounting as described in Specification 5, within a rigid housing that includes vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Restraining Bolts shall have a neoprene bushing between the bolt and the housing. Limit stops shall be out of contact during normal operation. Since housings will be bolted or welded in position there must be an internal isolation pad. Housing shall be designed to resist all seismic forces. Mountings shall have Anchorage Preapproval OPA Number from OSHPD in the state of California certifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SLR** or **SLRS** as manufactured by Mason Industries, Inc.

7. Spring mountings as in specification 5 built into a ductile iron or steel housing to provide all directional seismic snubbing. The snubber shall be adjustable vertically and allow a maximum of 1/4" travel in all directions before contacting the resilient snubbing collars. Mountings shall have an Anchorage Preapproval OPA number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SSLFH** as manufactured by Mason Industries, Inc.

8. Air Springs shall be manufactured with upper and lower steel sections connected by a

replaceable flexible nylon reinforced neoprene element. Air spring configuration shall be multiple bellows to achieve a maximum natural frequency of 3 Hz. Air Springs shall be designed for a burst pressure that is a minimum of three times the published maximum operating pressure. All air spring systems shall be connected to either the building control air or a supplementary air supply and equipped with three leveling valves to maintain leveling within plus or minus 1/8". Submittals shall include natural frequency, load and damping tests performed by an independent lab or acoustician. Air Springs shall be type **MT** and leveling valves type **LV** as manufactured by Mason Industries, Inc.

9. Restrained air spring mountings shall have an **MT** air spring as described in Specification 8, within a rigid housing that includes vertical limit stops to prevent air spring extension when weight is removed. The housing shall serve as blocking during erection. A steel spacer shall be removed after adjustment. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the air spring so as not to interfere with the air spring action. Limit stops shall be out of contact during normal operation. Housing shall be designed to resist all seismic forces. Mountings shall be type **SLR-MT** as manufactured by Mason Industries, Inc.

10. Hangers shall consist of rigid steel frames containing minimum 1 1/4" (32mm) thick neoprene elements at the top and a steel spring with general characteristics as in specification 5 seated in a steel washer reinforced neoprene cup on the bottom. The neoprene element and the cup shall have neoprene bushings projecting through the steel box. To maintain stability the boxes shall not be articulated as clevis hangers nor the neoprene element stacked on top of the spring. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30E arc from side to side before contacting the rod bushing and short circuiting the spring. Submittals shall include a hanger drawing showing the 30E capability. Hangers shall be type **30N** as manufactured by Mason Industries, Inc.

10A. Hangers shall be as described in 10, but they shall be supplied with a combination rubber and steel rebound washer as the seismic upstop for suspended piping, ductwork, equipment and electrical cabletrays. Rubber thickness shall be a minimum of 1/4". Submittals shall include a drawing of the hanger showing the installation of the rebound washer. Hangers shall be type **RW30N** as manufactured by Mason Industries, Inc.

11. Hangers shall be as described in 10, but they shall be precompressed and locked at the rated deflection by means of a resilient seismic upstop to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a drawing of the hanger showing the 30E capability. Hangers shall be type **PC30N** as manufactured by Mason Industries, Inc.

12. Seismic Cable Restraints shall consist of galvanized steel aircraft cables sized to resist seismic loads with a minimum safety factor of two and arranged to provide all-directional restraint. Cables must be prestretched to achieve a certified minimum modulus of elasticity. Cable end connections shall be steel assemblies that swivel to final installation angle and utilize two clamping bolts to provide proper cable engagement. Cables must not be allowed to bend across sharp edges. Cable assemblies shall have an Anchorage Preapproval OPA Number from

OSHPD in the State of California verifying the maximum certified load ratings. Cable assemblies shall be type **SCB** at the ceiling and at the clevis bolt, **SCBH** between the hanger rod nut and the clevis or **SCBV** if clamped to a beam, all as manufactured by Mason Industries, Inc.

13. Seismic solid braces shall consist of steel angles or channels to resist seismic loads with a minimum safety factor of 2 and arranged to provide all directional restraint. Seismic solid brace end connectors shall be steel assemblies that swivel to the final installation angle and utilize two through bolts to provide proper attachment. Seismic solid brace assembly shall have anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified load ratings. Solid seismic brace assemblies shall be type **SSB**, **SSBS** or **SSRF** as manufactured by Mason Industries, Inc.

Note: Specifications 12 - 14 apply to trapeze as well as clevis hanger locations. At trapeze anchor locations piping must be shackled to the trapeze. Specifications apply to hanging equipment as well.

14. Steel angles, sized to prevent buckling, shall be clamped to pipe or equipment rods utilizing a minimum of three ductile iron clamps at each restraint location when required. Welding of support rods is not acceptable. Rod clamp assemblies shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Rod clamp assemblies shall be type **SRC** or **UC** as manufactured by Mason Industries, Inc.

15. Pipe clevis cross bolt braces are required in all restraint locations. They shall be special purpose preformed channels deep enough to be held in place by bolts passing over the cross bolt. Clevis cross braces shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Clevis cross brace shall be type **CCB** as manufactured by Mason Industries, Inc.

16. All-directional seismic snubbers shall consist of interlocking steel members restrained by a one-piece molded neoprene bushing of bridge bearing neoprene. Bushing shall be replaceable and a minimum of 1/4" thick. Rated loadings shall not exceed 1000 psi. A minimum air gap of 1/8" shall be incorporated in the snubber design in all directions before contact is made between the rigid and resilient surfaces. Snubber end caps shall be removable to allow inspection of internal clearances. Neoprene bushings shall be rotated to insure no short circuits exist before systems are activated. Snubbers shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Snubber shall be type **Z-1225** as manufactured by Mason Industries, Inc.

17. All directional seismic snubbers shall consist of interlocking steel members restrained by shock absorbent rubber materials compounded to bridge bearing specifications. Elastomeric materials shall be replaceable and a minimum of 3/4" thick. Rated loadings shall not exceed 1000 psi. Snubbers shall be manufactured with an air gap between hard and resilient material of not less than 1/8" nor more than 1/4". Snubbers shall be installed with factory set clearances. The capacity of the seismic snubber at 3/8" deflection shall be equal or greater than the load assigned to the mounting grouping controlled by the snubber multiplied by the applicable G force. Submittals shall include the load deflection curves up to 1/2" deflection in the x, y and z planes. Snubbers shall have an anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified horizontal and vertical load ratings. Snubbers shall be

type **Z-1011** as manufactured by Mason Industries, Inc.

18. Stud wedge anchors shall be manufactured from full diameter wire, not from undersized wire that is rolled up to create the thread. The stud anchor shall also have a safety shoulder which fully supports the wedge ring under load. The stud anchors shall have an evaluation report number from the I.C.B.O. Evaluation Service, Inc. verifying its allowable loads. Drill-in stud wedge anchors shall be type **SAS** as manufactured by Mason Industries, Inc.

19. Female wedge anchors are preferred in floor locations so isolators or equipment can be slid into place after the anchors are installed. Anchors shall be manufactured from full diameter wire, and shall have a safety shoulder to fully support the wedge ring under load. Female wedge anchors shall have an evaluation report number from the I.C.B.O. Evaluation Service, Inc. verifying its allowable loads. Drill-in female wedge anchors shall be type **SAB** as manufactured by Mason Industries, Inc.

20. Vibration isolation manufacturer shall furnish integral structural steel bases. Rectangular bases are preferred for all equipment. Centrifugal refrigeration machines and pump bases may be T or L shaped where space is a problem. Pump bases for split case pump shall include supports for suction and discharge elbows. All perimeter members shall be steel beams with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14" provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1". Bases shall be type **WF** as manufactured by Mason Industries, Inc.

21. Vibration isolation manufacturer shall furnish rectangular steel concrete pouring forms for floating and inertia foundations. Bases for split case pumps shall be large enough to provide for suction and discharge elbows. Bases shall be a minimum of 1/12 of the longest dimension of the base but not less than 6". The base depth need not exceed 12" unless specifically recommended by the base manufacturer for mass or rigidity. Forms shall include minimum concrete reinforcing consisting of 1/2" bars welded in place on 6" centers running both ways in a layer 1" above the bottom. Forms shall be furnished with steel templates to hold the anchor bolts sleeves and anchors while concrete is being poured. Height saving brackets shall be employed in all mounting locations to maintain a 1" clearance below the base. Wooden formed bases leaving a concrete rather than a steel finish are not acceptable. Base shall be type **BMK** or **K** as manufactured by Mason Industries, Inc.

22. Curb mounted rooftop equipment shall be mounted on spring isolation curbs. The lower member shall consist of a sheet metal or structural steel sections containing adjustable and removable steel springs that support the upper floating section. The upper frame must provide continuous support for the equipment and must be captive so as to resiliently resist wind and seismic forces. All directional neoprene snubber bushings shall be a minimum of 1/4" thick. Steel springs shall be laterally stable and rest on 1/4" thick neoprene acoustical pads. Hardware must be plated and the springs provided with a rust resistant finish. The curbs waterproofing shall consist of a continuous flexible flashing nailed over the lower curbs waterproofing. All spring locations shall have accessibility to adjust springs. Lower curbs shall have provision for 2" of insulation. The roof curbs shall be built to seismically contain the rooftop unit. The unit must be solidly fastened to the top floating rail, and the lower section anchored to the roof structure. Curb shall have anchorage pre-approval OPA from OSHPD in the state of California attesting to the

maximum certified horizontal and vertical load ratings. Curb shall be type **SRSC** or **RMSS** as manufactured by Mason Industries, Inc.

23. Flexible spherical expansion joints shall employ peroxide cured EPDM in the covers, liners and Kevlar tire cord frictioning. Any substitutions must have equal or superior physical and chemical characteristics. Solid steel rings shall be used within the raised face rubber flanged ends to prevent pullout. Flexible cable bead wire is not acceptable. Sizes 2" and larger shall have two spheres reinforced with a ductile iron external ring between spheres. Flanges shall be split ductile iron or steel with hooked or similar interlocks. Sizes 16" to 24" may be single sphere. Sizes 6" to 12" may have threaded two piece bolted flange assemblies, one sphere and cable retention. Connectors shall be rated at 250 psi up to 170EF (77EC) with a uniform drop in allowable pressure to 215 psi (1.48MPa) at 250EF (121EC) in sizes through 14" (350mm). 16" (400mm) through 24" (600mm) single sphere minimum ratings are 180 psi (1.24MPa) at 170EF (77EC) and 150 psi (1.03MPa) at 250EF (121EC). Higher rated connectors may be used to accommodate service conditions. All expansion joints must be factory tested to 150% of rated pressure for 12 minutes before shipment. Safety factors to burst and flange pullout shall be a minimum of 3/1. Concentric reducers to the above ratings may be substituted for equal ended expansion joints.

Expansion joints shall be installed in piping gaps equal to the length of the expansion joints under pressure. Control rods need only be used in unanchored piping locations where the manufacturer determines the installation exceeds the pressure requirement without control rods. If control rods are used, they must have .75" (12mm) thick Neoprene washer bushings large enough in diameter to take the thrust at 1000 psi (.7 kg/mm²) maximum on the washer area.

Submittals shall include two test reports by independent consultants showing minimum reductions of 20 DB in vibration accelerations and 10 DB in sound pressure levels at typical blade passage frequencies on this or a similar product by the same manufacturer. All expansion joints shall be installed on the equipment side of the shut off valves. Expansion joints shall be type **SAFEFLEX**, **SFDEJ**, **SFEJ**, **SFDCR** or **SFU** and Control Rods **CR** as manufactured by Mason Industries, Inc.

24. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3" and larger shall be flanged. Smaller sizes shall have male nipples. Minimum lengths shall be as tabulated:

25. All-directional acoustical pipe anchor, consisting of two sizes of steel tubing separated by a minimum 1/2" thick 60 durometer neoprene. Vertical restraint shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material should not exceed 500 psi and the design shall be balanced for equal resistance in any direction. All-directional anchors shall be type **ADA** as manufactured by Mason Industries, Inc.

26. Pipe guides shall consist of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1/2" thickness of 60 durometer neoprene. The height of the guides shall be preset with a shear pin to allow vertical motion due to pipe expansion or contraction. Shear pin shall be removable and reinsertable to allow for selection of pipe movement. Guides shall be capable of $\pm 1 \frac{5}{8}$ " motion, or to meet location requirements. Pipe guides shall be type **VSG** as manufactured by Mason Industries, Inc.

27. Split Wall Seals consist of two bolted pipe halves with minimum 3/4" thick neoprene sponge

bonded to the inner faces. The seal shall be tightened around the pipe to eliminate clearance between the inner sponge face and the piping. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not already in place around the pipe prior to the construction of the building member. Seals shall project a minimum of 1" past either face of the wall. Where temperatures exceed 240°F(115°C), 10# density fiberglass may be used in lieu of the sponge. Seals shall be type **SWS** as manufactured by Mason Industries, Inc.

28. The horizontal thrust restraint shall consist of a spring element in series with a neoprene molded cup as described in specification 5 with the same deflection as specified for the mountings or hangers. The spring element shall be designed so it can be preset for thrust at the factory and adjusted in the field to allow for a maximum of 1/4" movement at start and stop. The assembly shall be furnished with 1 rod and angle brackets for attachment to both the equipment and the ductwork or the equipment and the structure. Horizontal restraints shall be attached at the centerline of thrust and symmetrical on either side of the unit. Horizontal thrust restraints shall be type **WBI/WBD** as manufactured by Mason Industries, Inc.

29. Housekeeping pad anchors shall consist of a ductile iron casting that is tapered and hexagonal, smaller at its base than at its top. The upper portion shall have holes for rebar to pass through. The anchor shall be continuously threaded from top to bottom for the attachment of soleplates. Housekeeping pad anchors shall be attached to the structural slab using a stud wedge anchor. Housekeeping pad anchors shall be type **HPA** and stud wedge anchor shall be type **SAS** both as manufactured by Mason Industries, Inc.

PART 3 - EXECUTION

3.01 General

All vibration isolators and seismic restraint systems must be installed in strict accordance with the manufacturers written instructions and all certified submittal data.

Installation of vibration isolators and seismic restraints must not cause any change of position of equipment, piping or ductwork resulting in stresses or misalignment.

No rigid connections between equipment and the building structure shall be made that degrades the noise and vibration control system herein specified.

The contractor shall not install any equipment, piping, duct or conduit which makes rigid connections with the building unless isolation is not specified. Building includes, but is not limited to, slabs, beams, columns, studs and walls.

Coordinate work with other trades to avoid rigid contact with the building.

Any conflicts with other trades which will result in rigid contact with equipment or piping due to inadequate space or other unforeseen conditions should be brought to the architects/engineers attention prior to installation. Corrective work necessitated by conflicts after installation shall be at the responsible contractors expense.

Bring to the architects/engineers attention any discrepancies between the specifications and the field conditions or changes required due to specific equipment selection, prior to installation. Corrective work necessitated by discrepancies after installation shall be at the responsible contractors expense.

Correct, at no additional cost, all installations which are deemed defective in workmanship and materials at the contractors expense.

Overstressing of the building structure must not occur because of overhead support of equipment. Contractor must submit loads to the structural engineer of record for approval. Generally bracing may occur from:

Flanges of structural beams.

Cast in place inserts or wedge type drill-in concrete anchors.

Specification 12 cable restraints shall be installed slightly slack to avoid short circuiting the isolated suspended equipment, piping or conduit.

Specification 12 cable assemblies are installed taut on non-isolated systems. Specification 13 seismic solid braces may be used in place of cables on rigidly attached systems only.

At locations where specification 12 or 13 restraints are located, the support rods must be braced when necessary to accept compressive loads with specification 14 braces.

At locations where specification 12 cable restraints are installed on support rods with spring isolators, the spring isolation hangers must be specification type 10A.

At all locations where specification 12 or 13 restraints are attached to pipe clevis, the clevis cross bolt must be reinforced with specification type 15 braces.

Drill-in concrete anchors for ceiling and wall installation shall be specification type 18, and specification type 19 female wedge type for floor mounted equipment.

Vibration isolation manufacturer shall furnish integral structural steel bases as required. Independent steel rails are not permitted on this project.

Where piping passes through walls, floors or ceilings the vibration isolation manufacturer shall provide specification 27 wall seals.

Air handling equipment and centrifugal fans shall be protected against excessive displacement which results from high air thrust in relation to the equipment weight. Horizontal thrust restraint shall be specification type 28 (see selection guide).

Locate isolation hangers as near to the overhead support structure as possible.

All mechanical equipment shall be vibration isolated and seismically restrained as per the schedules in part 4 of this specification.

3.02 Vibration Isolation of Piping

Horizontal pipe isolation: The first four pipe hangers in the main lines near the mechanical equipment shall be as described in specification 11. Brace hanger rods with SRC clamps specification 14. Horizontal runs in all other locations throughout the building shall be isolated by hangers as described in specification 10 & 10A. Floor supported piping shall rest on isolators as described in specification 6. Heat exchangers and expansion tanks are considered part of the piping run. The first three isolators from the isolated equipment will have the same static deflection as specified for the mountings under the connected equipment. If piping is connected to equipment located in basements and hangs from ceilings under occupied spaces the first three hangers shall have 0.75" deflection for pipe sizes up to and including 3", 1 1/2" deflection for pipe sizes up to and including 6" and 2 1/2" deflection thereafter. Hangers shall be located as close to the overhead structure as practical. Hanger locations that also have seismic restraints attached must have type RW Rebound Washers to limit uplift. Where piping connects to mechanical equipment install specification 23 expansion joints or specification 24 stainless hoses if 23 is not suitable for the service.

Riser isolation: Risers shall be suspended from specification 10A hangers or supported by specification 5 mountings, anchored with specification 25 anchors, and guided with specification 26 sliding guides. Steel springs shall be a minimum of 0.75" except in those expansion locations where additional deflection is required to limit load changes to ∇ 25% of the initial load. Submittals must include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on the building structure, spring deflection changes and seismic loads. Submittal data shall include certification that the riser system has been examined for excessive stresses and that none will exist in the proposed design.

3.03 Seismic Restraint of Piping

Seismically restrain all piping listed below. Use specification 12 cables if isolated. Specification 12 or 13 restraints may be used on un-isolated piping.

Gas piping air piping that is 1" I.D. or larger.

Piping located in mechanical equipment rooms that is 1 1/4" I.D. and larger.

All other piping 2 1/2" diameter and larger.

Transverse piping restraints shall be at 40' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

Longitudinal restraints shall be at 80' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

For gas piping transverse restraints must be at 20' maximum and longitudinal restraints at 40' maximum spacing.

Transverse restraint for one pipe section may also act as a longitudinal restraint for a pipe section of the same size connected perpendicular to it if the restraint is installed within 24" of the elbow or TEE or combined stresses are within allowable limits at longer distances.

Hold down clamps must be used to attach pipe to all trapeze members before applying restraints in a manner similar to clevis supports.

Branch lines may not be used to restrain main lines.

Cast iron pipe of all types, glass pipe and any other pipes joined with a four band shield and clamp assembly in areas with S_s of 0.35 or greater shall be braced as in sections 3.02.C.2 and 3. For areas with S_s less than 0.35, 2 band clamps may be used with a reduced spacing of 1/2 of those listed in sections 3.02.C.2 and 3.

Connection to the structure must be made with a non-friction connection (i.e. no "C" clamps)

Hanger locations that also have seismic restraints attached must have Specification 10A type RW Rebound Washers.

3.04 Pipe Exclusions

Gas piping less than 1" inside diameter.

Piping in mechanical rooms less than 1 1/4" inside diameter.

All other piping less than 2 1/2" inside diameter.

All piping suspended by clevis hangers where the distance from the top of the pipe to the suspension point is 12" or less.

All trapezed piping where the distance from the suspension point to the trapeze member is 12" or less.

If any suspension location in the run exceeds the above, the entire run must be braced.

END OF SECTION 220548

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SECTION 220553

PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.02 DESCRIPTION OF WORK:

Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-15 sections.

Types of identification devices specified in this section include the following:

- Painted Identification Materials.
- Plastic Pipe Markers.
- Plastic Tape.
- Underground-Type Plastic Line Marker.
- Valve Tags.
- Valve Schedule Frames.
- Engraved Plastic-Laminate Signs.
- Plastic Equipment Markers.
- Plasticized Tags.

1.03 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards:

ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.04 SUBMITTALS:

Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required.

Samples: Submit samples of each color, lettering style and other graphic representation required for each identification material or system.

Schedules: Submit valve schedule for each piping system, typewritten and reproduced on 8-1/2" x 11" bond paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves which are intended for emergency shut-off and similar special uses, by special "flags", in margin of schedule. In addition to mounted copies, furnish extra copies for Maintenance Manuals as specified in Division 1.

Maintenance Data: Include product data and schedules in maintenance manuals.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering mechanical identification materials which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide mechanical identification materials of one of the following:

Allen Systems, Inc.
Brady (W.H.) Co.; Signmark Div.
Industrial Safety Supply Co., Inc.
Seton Name Plate Corp.

2.02 MECHANICAL IDENTIFICATION MATERIALS:

General: Provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for application, selection shall be approved by the FDNY prior to installation, provide single selection for each product category.

2.03 PAINTED IDENTIFICATION MATERIALS:

Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.

Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.

Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ANSI A13.1 for colors.

2.04 PLASTIC PIPE MARKERS:

Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid snap-on, color-coded pipe markers, complying with ANSI A13.1

Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1

Insulation: Furnish 1" thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed on uninsulated pipes subjected to fluid temperatures of 125 degrees F or greater. Cut length to extend 2" beyond each end of plastic pipe marker.

Small Pipes: For external diameters less than 6" (including insulation if any), provide full-band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:

Snap-on application of pre-tensioned semi-rigid plastic pipe marker.

Adhesive lap joint in pipe marker overlap.

Laminated or bonded application of pipe marker to pipe (or insulation).

Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 3/4" wide; full circle at both ends of pipe marker, tape lapped 1-1/2".

Large Pipes: For external diameters of 6" and larger (including insulation if any), provide either full-band or strip-type pipe markers, but not narrower than 3 times letter height (and of required length), fastened by one of the following methods:

Laminated or bonded application of pipe marker to pipe (or insulation).

Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 1-1/2" wide; full circle at both ends of pipe marker, tape lapped 3".

Strapped-to-pipe (or insulation) application of semi-rigid type, with manufacturer's standard stainless steel bands.

Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in

each instance, as selected by Architect/Engineer in cases of variance with names as shown or specified.

Lettering: Comply with piping system nomenclature as specified, scheduled or shown, and abbreviate only as necessary for each application length.

Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as a separate unit of plastic.

2.05 UNDERGROUND-TYPE PLASTIC LINE MARKER:

General: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates the type of service of buried pipe.

Provide multi-ply tape consisting of solid aluminum foil core between 2-layers of plastic tape.

2.06 VALVE TAGS:

Brass Valve Tags: Provide 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener.

Provide 1-1/2" diameter tags, except as otherwise indicated.

Provide size and shape as specified or scheduled for each piping system.

Fill tag engraving with black enamel.

Provide size, shape and color combination as specified or scheduled for each piping system.

Valve Tag Fasteners: Provide manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.

Access Panel Markers: Provide manufacturer's standard 1/16" thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve. Include 1/8" center hole to allow attachment.

2.07 VALVE SCHEDULE FRAMES:

General: For each page of valve schedule, provide glazed display frame, with screws for removable mounting on masonry walls. Provide frames of finished hardwood or extruded aluminum, with

SSB-grade sheet glass.

2.08 ENGRAVED PLASTIC-LAMINATE SIGNS:

General: Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

Thickness: 1/8", except as otherwise indicated.

Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.09 PLASTIC EQUIPMENT MARKERS:

General: Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code:

Yellow: Heating equipment and components.

Blue: Equipment and components that do not meet any of the above criteria.

For hazardous equipment, use colors and designs recommended by ANSI A13.1.

Nomenclature: Include the following, matching terminology on schedules as closely as possible:

Name and plan number.

Equipment service.

Design capacity.

Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.

Size: Provide approximate 2-1/2" x 4" markers for control devices, dampers, and valves; and 4-1/2" x 6" for equipment.

2.10 LETTERING AND GRAPHICS:

General: Coordinate names, abbreviations and other designations used in mechanical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS:

Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.02 PIPING SYSTEM IDENTIFICATION:

General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:

Plastic pipe markers, with application system as indicated under "Materials" in this section. Install on pipe insulation segment where required for hot non-insulated pipes.

Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Near each valve and control device.

Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.

Near locations where pipes pass through walls or floors/ ceilings, or enter non-accessible enclosures.

At access doors, manholes and similar access points which permit view of concealed piping.

Near major equipment items and other points of origination and termination.

Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

On piping above removable acoustical ceilings.

3.02 UNDERGROUND PIPING IDENTIFICATION:

General: During back-filling/top-soiling of each exterior underground piping systems, install continuous underground-type plastic line marker, located directly over buried line at 6" to 8" below finished grade. Where multiple small lines are buried in common trench and do not exceed overall width of 16", install

single line marker. For tile fields and similar installations, mark only edge pipe lines of field.

3.03 VALVE IDENTIFICATION:

General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. List each tagged valve in valve schedule for each piping system.

Tagging Schedule: Comply with requirements of "Valve Tagging Schedule" at end of this section.

Mount valve schedule frames and schedules in machine rooms where indicated or, if not otherwise indicated, where directed by Architect/Engineer.

Where more than one major machine room is shown for project, install mounted valve schedule in each major machine room, and repeat only main valves which are to be operated in conjunction with operations of more than single machine room.

3.04 MECHANICAL EQUIPMENT IDENTIFICATION:

General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device. Provide signs for the following general categories of equipment and operational devices:

Main control and operating valves, including safety devices and hazardous units such as gas outlets.

Meters, gages, thermometers and similar units.

Fuel-burning units including heaters.

Pumps, and similar motor- driven units.

Optional Sign Types: Where lettering larger than 1" height is needed for proper identification, because of distance from normal location of required identification, stenciled signs may be provided in lieu of engraved plastic, at Installer's option.

Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proportionately larger lettering for greater distances. Provide secondary lettering of 2/3 to 3/4 of size of the principal lettering.

Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

Operational valves and similar minor equipment items located in non-occupied spaces (including machine rooms) may, at Installer's option, be identified by installation of plasticized tags in lieu of engraved plastic signs.

3.05 ADJUSTING AND CLEANING:

Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

Cleaning: Clean face of identification devices, and glass frames of valve charts.

3.06 EXTRA STOCK:

Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

Where stenciled markers are provided, clean and retain stencils after completion of stenciling and include used stencils in extra stock, along with required stock of stenciling paints and applicators.

END OF SECTION 220553

SECTION 220719

PLUMBING INSULATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data and installation instructions for each type of insulation. Submit schedule showing manufacturer's product number, k-value, thickness, and furnished accessories for each system requiring insulation.

1.03 DESCRIPTION OF WORK:

Extent of Plumbing insulation required by this section is covered by requirements of this section.

Types of Plumbing insulation specified in this section include the following:

Piping Systems Insulation:

Fiberglass.

1.04 QUALITY ASSURANCE:

Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

Flame/Smoke Ratings: Provide composite Plumbing insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.05 DELIVERY, STORAGE, AND HANDLING:

Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard indexes of products.

Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Certainteed Corp.
Knauf Fiber Glass GmbH.
Manville Products Corp.
Owens-Corning Fiberglas Corp.
Or approved equal.

2.02 PIPING INSULATION MATERIALS:

Fiberglass Piping Insulation: ASTM C 547, Class 1 unless otherwise indicated.

Jackets for Piping Insulation: ASTM C 921, Type I for piping with temperatures below ambient, Type II for piping with temperatures above ambient. Type I may be used for all piping at Installers option.

Encase pipe fittings insulation with one-piece premolded fitting covers, fastened as per manufacturer's recommendations.

Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine areas and conditions under which Plumbing insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 PLUMBING PIPING SYSTEM INSULATION:

Insulation Omitted: Omit insulation on hot piping within radiation enclosures or unit cabinets; on condensate piping between steam trap and union; and on unions, flanges, strainers, flexible

connections, and expansion joints.

Cold Piping:

Application Requirements: Insulate the following cold Plumbing piping systems:

Domestic Cold Water Piping

Hot Piping:

Application Requirements: Insulate the following hot Plumbing piping systems.

Domestic Hot Water Piping

Insulate each piping system specified above with one of the following types and thicknesses of insulation:

Fiberglass: 1" thick for pipe sizes up to and including 2".

3.03 INSTALLATION OF PIPING INSULATION:

General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

Install insulation on pipe systems subsequent to installation of heat tracing, painting, testing, and acceptance of tests.

Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with a single cut piece to complete run. Do not use cut pieces or scraps abutting each other.

Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure a complete and tight fit over surfaces to be covered.

Maintain integrity of vapor-barrier jackets on pipe insulation, and protect to prevent puncture or other damage.

Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded or precut units.

Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.

Butt pipe insulation against pipe hanger insulation inserts. For hot pipes, apply 3" wide vapor barrier tape or band over the butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints and seal joints with 3" wide vapor barrier tape or band.

3.04 PROTECTION AND REPLACEMENT:

Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

Protection: Insulation Installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

END OF SECTION 220719

SECTION 221116

PLUMBING DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for the following plumbing piping products:

Couplings and fittings for hubless cast-iron pipe and fittings.

Couplings and fittings for threaded and soldered copper tube, brass and copper fittings.

Coordination drawings, drawn accurately to scale and coordinating penetrations.

1.03 QUALITY ASSURANCE

Comply with the provisions of the New York City Building and Plumbing Code for materials, products, and installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2.02 PIPES AND TUBES

General: The application of the following pipe, tube, and fitting materials and joining methods required for plumbing piping systems are indicated in Part 3 Article "Pipe and Fittings Applications."

Hard Copper Tube: ASTM B 88, Types L, water tube, drawn temper.

2.03 PIPE FITTINGS AND TUBE FITTINGS

Wrought-Copper, Solder-Joint Pressure Fittings: ASME B16.22.

Cast-Copper-Alloy, Solder-Joint Pressure Fittings: ASME B16.18.

Copper Unions: ASME B16.18, cast-copper-alloy body, hexagonal stock, with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends.

Threaded Ends: Threads conforming to ASME B1.20.1.

2.04 JOINING MATERIALS

Solder, brazing, and welding filler metals are specified in Division 15 Section "Basic Mechanical Materials and Methods."

2.05 VALVES

Refer to Division 15 Section "Valves" for gate, globe, ball, butterfly, and check valves.

Refer to Division 15 Section "Plumbing Specialties" for special-duty valves.

PART 3 - EXECUTION

3.01 PIPE AND FITTINGS APPLICATIONS

General: Use pipe, tube, fittings, and joining methods for piping systems according to the following applications.

Water Distribution Piping Above Ground: Use the following:

4 Inches and Smaller: Hard copper tube, Type L; wrought-copper or cast-copper or brass; copper unions; and solder joints with Alloy 95-5 solder.

3.02 VALVE APPLICATIONS

Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

Shutoff Duty: Use gate or ball valves.

Throttling Duty: Use ball valves.

3.03 PIPING INSTALLATION, GENERAL

Basic piping installation requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

3.04 WATER DISTRIBUTION PIPING INSTALLATION

Install piping level without pitch.

3.05 JOINT CONSTRUCTION

Basic piping joint construction is specified in Division 15 Section "Basic Mechanical Materials and Methods."

Copper Tube: Dimple tube to form seating stop and braze branch tube into formed collar outlet.

3.06 INSTALLATION OF VALVES

Shutoff Valves: Install shutoff valves on inlet or outlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated. For shutoff valves 2 inches and smaller, use gate or ball valves;

Install hose-end drain valves at low points in water mains, risers, and branches.

Install stop and waste drain valves where indicated.

3.07 HANGERS AND SUPPORTS INSTALLATION

Hanger and support devices are specified in Section "Supports and Anchors."

Install hangers for horizontal piping with following maximum spacing and minimum rod sizes:

Nom. Pipe Size (Inches)	Cast-iron Pipe Max. Span (Feet)	Copper Tube Max. Span (Feet)	Min. Rod Diameter (Inches)
Up to 3/4"	5	3/8	
1	7	6	3/8
1-1/4	7	7	3/8
1-1/2	9	8	3/8
2	10	8	3/8

2-1/2	11	9	1/2
3	12	10	1/2
3-1/2	13	11	1/2
4	14	12	5/8, 1/2 for copper

Support vertical pipe and copper tube at each floor.

Conform to table below for maximum spacing of supports:

Pipe Material	Horizontal In Feet	Vertical In Feet
Copper Tubing - 1-1/4 Inches and Smaller	6	10
Copper Tubing - 1-1/2 Inches and Larger	10	10

Pipe Attachments: Install the following:

Riser Clamps: MSS Type 8 or Type 42 for vertical runs.

Adjustable Steel Clevis Hangers: MSS Type 1 for individual straight horizontal runs 100 feet and less.

Adjustable Roller Hangers: MSS Type 43 for individual straight horizontal runs longer than 100 feet.

3.08 CONNECTIONS

Supply Runouts to Fixtures: Install hot- and cold-water supply piping runouts of sizes indicated, but not smaller than required by plumbing code to fixtures.

Mechanical Equipment Connections: Connect hot- and cold-water supply piping system to mechanical equipment as indicated. Provide shutoff valve and union for each connection; provide drain valve on drain connection.

3.09 FIELD QUALITY CONTROL

Inspect water distribution piping as follows:

Do not enclose, cover, or put into operation water distribution piping system until it has been inspected and approved by the authority having jurisdiction.

During progress of the installation, notify the plumbing official having jurisdiction at least 24 hours prior to time inspection must be made. Perform tests specified below in presence of the plumbing official.

Roughing-In Inspection: Arrange for inspection of piping system before concealed or closed-in after

system roughing-in and prior to setting fixtures.

Final Inspection: Arrange for final inspection by plumbing official to observe tests specified below and to ensure compliance with requirements of plumbing code.

Reinspections: When a plumbing official finds that piping system will not pass test or inspection, make required corrections and arrange for reinspection by the plumbing official.

Reports: Prepare inspection reports signed by plumbing official.

Test water distribution piping as follows:

Test for leaks and defects in new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of system tested.

Leave uncovered and unconcealed in new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved for testing.

Cap and subject the piping system to a static water pressure of 50 psig above the operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.

Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.

Prepare reports for tests and required corrective action.

Inspect drainage piping as follows:

Do not enclose, cover, or put into operation drainage and vent piping system until it has been inspected and approved by the authority having jurisdiction.

During progress of installation, notify the plumbing official having jurisdiction at least 24 hours prior to time such inspection must be made. Perform tests specified below in presence of the plumbing official.

Roughing-In Inspection: Arrange for inspection of piping system after system roughing-in, before concealing, and prior to setting fixtures.

Final Inspection: Arrange for final inspection by plumbing official to observe tests specified below and to ensure compliance with requirements of plumbing code.

Reinspections: Make required corrections and arrange for reinspection by plumbing official when piping system fails to pass test or inspection.

Reports: Prepare inspection reports signed by the plumbing official.

3.10 CLEANING

Clean and disinfect water distribution piping as follows:

Purge new potable water distribution piping systems and parts of existing potable water systems that have been altered, extended, or repaired prior to use.

Use purging and disinfecting procedure prescribed by the New York City Plumbing Code and as described below:

Flush piping system with clean, potable water until dirty water does not appear at outlets.

Fill system or part thereof with water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) and allow to stand for 24 hours.

Drain system or part thereof of previous solution and refill with water/chlorine solution containing at least 200 parts per million of chlorine. Isolate and allow to stand for 3 hours.

Flush system with clean, potable water until chlorine does not remain in water coming from system following allowed standing time.

Submit water samples in sterile bottles to authority having jurisdiction. Repeat procedure if biological examination made by the authority shows evidence of contamination.

Prepare and submit reports for purging and disinfecting activities.

Clean interior of piping system. Remove dirt and debris as work progresses.

3.11 COMMISSIONING

Fill water systems. Check compression tanks to determine that they are not air bound and that system is completely full of water.

Before operating systems, perform these steps:

Close drain valves, hydrants, and hose bibbs.

Open shutoff valves to full open position.

Open throttling valves to proper setting.

Remove plugs used during testing of piping systems and plugs used for temporary sealing of piping during installation.

Remove and clean strainer screens. Close drain valves and replace drain plugs.

Remove filter cartridges from housings and verify that cartridges are as specified for application where used, clean, and ready for use.

Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

Check plumbing specialties and verify proper settings, adjustments, and operation.

Energize pumps and verify proper operation.

3.12 PROTECTION

Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

Place plugs in ends of uncompleted piping at end of day or when work stops.

END OF SECTION 221116

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SECTION 221119
PLUMBING SPECIALTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

This Section includes plumbing specialties for water distribution systems; soil, waste, and vent systems; and storm drainage systems.

Related Sections: The following sections contain requirements that relate to this Section:

"Basic Mechanical Materials and Methods" for piping-joining materials, joint construction, basic installation requirements, and labeling and identifying requirements.

Section "Valves" for gate, ball, butterfly, globe, and check valves.

Section "Plumbing Piping" for piping and connections.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

Provide components and installation capable of producing piping systems with following minimum working pressure ratings, except where otherwise indicated:

Water Distribution Systems, Below Ground: 150 psig.

Water Distribution Systems, Above Ground: 125 psig.

Soil, Waste, and Vent Systems: 15-foot head of water.

Storm Drainage Systems: 15-foot head of water.

Sanitary Sewage, Pumped Piping Systems: 75 psig.

Storm Sewage, Pumped Piping Systems: 75 psig.

1.04 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract .

Submit product data including rated capacities of selected models and weights (shipping, installation, and operation). Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:

Water meters.

Backflow preventers.

Strainers.

Hose bibbs, wall hydrants, and post and sanitary hydrants.

Drain valves.

Water hammer arresters.

Trap seal primer valves.

Backwater valves.

Cleanouts, cover plates, and access panels.

Air-admittance valves.

Vent caps, vent terminals, and roof flashing assemblies.

Floor drains, open receptors, trench drains, and roof drains.

Sleeve penetration systems.

Maintenance data for inclusion in Operating and Maintenance manuals as specified in Division 1 Section "Project Closeout" for the following:

Water meters.

Backflow preventers.

Water pressure regulators.

Water filters.

Thermostatic water-mixing valves and water-tempering valves.

Sanitary hydrants.

Backwater valves.

Grease interceptors, grease recovery units, oil interceptors and oil storage tanks, and solids interceptors.

1.05 QUALITY ASSURANCE

Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

Electrical Component Standard: NFPA 70, "National Electrical Code."

Listing and Labeling: Provide equipment that is listed and labeled.

The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.

Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.06 EXTRA MATERIALS

Deliver extra materials to Owner. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and identify with labels clearly describing contents.

Operating Keys (Handles): Furnish 1 extra key for each key-operated hose bibb and hydrant installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Water Meters:

Water meters shall be provided as part of the backflow prevention device and shall comply with the requirements of the DEP, NYC Building code and all other codes and regulatory agencies having jurisdiction.

Water Specialties Corp.

Backflow Preventers:

Ames Co., Inc.
Hersey Products, Inc., Grinnell Corp.
Watts Regulator Co.
Or Approved equal.

Wall Hydrants:

Josam Co.
Smith by Jay R. Smith Mfg. Co. Div., Smith Industries, Inc.
Zurn by Hydromechanics Div., Zurn Industries, Inc.
Or approved equal.

Water Hammer Arresters:

Josam Co.
Smith by Jay R. Smith Mfg. Co. Div., Smith Industries, Inc.
Watts Regulator Co.
Zurn by Hydromechanics Div., Zurn Industries, Inc.
Or approved equal.

Trap Seal Primer Valves:

Josam Co.
Smith by Jay R. Smith Mfg. Co. Div., Smith Industries, Inc.
Watts Regulator Co.
Zurn by Hydromechanics Div., Zurn Industries, Inc.
Or approved equal.

Sleeve Penetration Systems:

Proset Systems, Inc.

2.02 BACKFLOW PREVENTERS

General: ASSE Standard, backflow preventers, of size indicated for maximum flow rate indicated and maximum pressure loss indicated.

Working Pressure: 150 psig minimum except where indicated otherwise.

2 Inches and Smaller: Bronze body with threaded ends.

2-1/2 Inches and Larger: Bronze, cast-iron, steel, or stainless-steel body with flanged ends.

Interior Lining: FDA-approved epoxy coating, for backflow preventers having cast-iron or steel body.

Interior Components: Corrosion-resistant materials.

Strainer on inlet, where strainer is indicated.

Double-Check Detector Assembly Backflow Preventers: ASSE 1048, FM approved or UL listed, consisting of OS&Y gate valves on inlet and outlet and strainer on inlet. Include 2 positive-seating check valves and test cocks, and bypass with displacement-type water meter, valves, and double-check backflow preventer, for continuous pressure application.

Pressure Loss: 5 psig maximum, through middle 1/3 of flow range.

2.03 MISCELLANEOUS PIPING SPECIALTIES

Piping specialties such as escutcheons, dielectric fittings, sleeves, and sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods."

Strainers: Y pattern, except where otherwise indicated, full size of connecting piping. Include Type 304 stainless-steel screens with 3/64-inch perforations except where other screens are indicated.

Pressure Rating: 125-psig minimum steam working pressure except where otherwise indicated.

Sizes 2 Inches and Smaller: Bronze body, with female threaded ends.

Sizes 2-1/2 Inches and Larger: Cast-iron body, with interior FDA-approved epoxy coating and flanged ends.

Y-Type Strainers: Screwed screen retainer with centered blowdown.

Drain: Pipe plug.

Drain: Factory- or field-installed, hose-end drain valve.

Hose Bibbs: Bronze body, with renewable composition disc, 1/2- or 3/4-inch threaded or solder-joint inlet. Provide ASME B1.20.7 garden-hose threads on outlet and integral or field-installed, nonremovable, drainable, hose-connection vacuum breaker.

Finish: Rough brass.

Finish: Chrome or nickel plated.

Operation: Wheel handle.

Operation: Operating key (handle). Provide 1 operating key.

Wall Hydrants: ASME A112.21.3M, nonfreeze, key operation. Provide 1 operating key.

Inlet: 3/4- or 1-inch threaded or solder joint.

Outlet: ASME B1.20.7 garden-hose threads, and integral or field-installed, nonremovable and drainable hose-connection vacuum breaker having ASME B1.20.7 garden-hose threads on outlet.

Type: Projecting.

Finish: As selected by Architect.

Wall Hydrants: ASME A112.21.3M or ASSE 1019, nonfreeze, automatic draining, antbackflow type, key operation, with 3/4- or 1-inch threaded or solder-joint inlet, and ASME B1.20.7 garden-hose threads on outlet. Provide 1 operating key.

Type: Recessed.

Finish: As selected by Architect.

Hose-End, Drain Valves: 3/4-inch ball valve, rated for 400 psig WOG. Include 2-piece bronze body conforming to ASTM B 62, standard port, chrome-plated brass ball, replaceable "TFE" seats and seals, blowout-proof stem, and vinyl-covered steel handle.

Inlet: Solder-joint or threaded.

Outlet: Short-threaded nipple with ASME B1.20.7 garden-hose thread and cap.

Stop-and-Waste Drain Valves: Ball valve or MSS SP-80 gate valve, rated for 200 psig WOG minimum, ASTM B 62 bronze body, with 1/8-inch side drain outlet and cap.

Water Hammer Arresters: ASME A112.26.1M, ASSE 1010, or PDI WH-201, bellows or piston type with pressurized cushioning chamber. Sizes are based on water-supply fixture units, ASME A112.26.1M sizes "A" through "F" and PDI WH-201 sizes "A" through "F."

Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, with the following characteristics:

125-psig minimum working pressure.

Bronze body with atmospheric-vented drain chamber.

Inlet and Outlet Connections: 1/2-inch threaded, union, or solder joint.

Gravity Drain Outlet Connection: 1/2-inch threaded or solder joint.

Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for termination of roofing membrane, and with threaded or hub top for extension of vent pipe.

Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe.

Vent Terminals: Commercially manufactured, shop-fabricated or field-fabricated, frost-proof assembly constructed of galvanized steel, copper, or lead-coated copper. Size to provide 1-inch enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing, as indicated.

Roof Flashing Assemblies: Manufactured assembly consisting of 4-psf lead flashing collar with boot and skirt extending at least 8 inches from pipe, with galvanized steel boot reinforcement and counterflashing fitting.

2.04 CLEANOUTS

General: Size cleanouts as indicated on drawings, or where not indicated, same size as connected drainage piping. Cleanouts larger than 4 inches are not required except where indicated.

Cleanouts: ASME A112.36.2M, cast-iron body with straight threads and gasket seal or taper threads for plug, flashing flange and clamping ring, and a brass closure plug. Cleanouts for installation in floors not having membrane waterproofing may be furnished without clamping ring. See Product Data Sheet at end of Part 3 of this Section for deck plate shape, top-loading classification, access cover, finish, and other specific features.

2.05 FLOOR DRAINS

General: Size outlets as indicated on Product Data Sheet or drawings.

Floor Drains: ASME A112.21.1M, cast-iron body, with seepage flange and clamping device. Floor drains for installation in floors not having membrane waterproofing may have seepage flange without clamping device. Floor drains for use as area drains in exterior slab on grade may be furnished with anchor flange instead of seepage flange and clamping device. See Product Data Sheet at end of Part 3 of this Section for shape, dimensions, strainer and body top finish, top-loading classification, sump size, and specific features.

Trench Drains: ASME A112.21.1M, cast-iron body, with seepage flange and clamping device. Trench drains for installation in floors not having membrane waterproofing may have seepage flange without clamping device. Trench drains for use as area drains in exterior slab on grade may be furnished with anchor flange or other anchoring device instead of seepage flange and clamping device. See Product Data Sheet at end of Part 3 of this Section for shape, dimensions, grate material, grate and body top finish, top-loading classification, sump size, number of outlets, and specific features.

Air Gap Fittings: ASME A112.1.2, cast iron or cast bronze, with fixed air gap, inlet for drain pipe or tube, and threaded or spigot outlet.

2.06 ROOF DRAINS

General: Size outlet as indicated on Product Data Sheet or drawings.

Roof Drains: ASME A112.21.2M, cast-iron body, with combination flashing ring and gravel stop, cast-iron dome except where other dome material is specified, extension collars, underdeck clamp, and sump receiver. Roof drains for installation in cast-in-place concrete decks may be furnished without underdeck clamp and sump receiver. See Product Data Sheet at end of Part 3 of this Section for dimensions, sump size, dome material, and specific features.

2.07 SLEEVE PENETRATION SYSTEMS

Description: UL 1479, through-penetration firestop assembly consisting of sleeve and stack fitting with firestopping plug.

Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on 1 end for installation in cast-in-place concrete slabs.

Stack Fitting: ASTM A 48, cast-iron, hubless-pattern, wye branch stack fitting with neoprene O ring at base and cast-iron plug in thermal-release harness in branch. Include PVC protective cap for plug.

Special Coating: Include corrosion-resistant interior coating on fittings for plastic chemical waste and vent stacks.

2.08 FLASHING MATERIALS

Lead: ASTM B 749, Type L51121, copper-bearing sheet, at least 4 psf (0.0625-inch thick) for general use, and at least 6 psf (0.0937-inch thick) for burning (welding), except as otherwise indicated.

Elastic Membrane: Nonreinforced flexible, black elastic, sheet, 50 to 65-mils thick and complying with the following:

Shore A Hardness: ASTM D 2240, 50 to 70.

Tensile Strength: ASTM D 412, 1200 psi.

Tear Resistance: ASTM D 624, Die C, 20 lb per linear inch.

Ultimate Elongation: ASTM D 412, 250 percent.

Low-Temperature Brittleness: ASTM D 746, minus 30 deg F (minus 35 deg C).

Resistance to Ozone Aging: ASTM D 1149, no cracks for 10 percent elongated sample for 100 hours in 50-mPa ozone at 104 deg F (70 deg C).

Resistance to Heat Aging: ASTM D 573, maximum hardness increase of 15 points, elongation reduction of 40 percent, and tensile strength reduction of 30 percent, for 70 hours at 212 deg F (100 deg C).

Copper: ASTM B 370, sheet, 16 oz. per sq. ft. (0.0216-inch thick) except as otherwise indicated.

General Use: Temper H00 (formerly cold-rolled).

Forming Use: Temper 060 (formerly soft).

Zinc-Coated Steel: ASTM A 526, sheet, with 0.20 percent copper, G90 hot-dip galvanized, mill phosphatized where indicated for painting; 0.0359-inch thick (20 gage) except as otherwise indicated.

Fasteners: Metal compatible with material and substrate being fastened.

Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units as required for installation; matching or compatible with material being installed.

Solder: ASTM B 32, Alloy Sn50.

Bituminous Coating: SSPC-12, solvent type, bituminous mastic.

PART 3 - EXECUTION

3.01 PIPING SPECIALTY INSTALLATION

Install backflow preventers of type, size, and capacity as indicated, on the drawings and as filed with the New York City DEP. Comply with plumbing code and authority having jurisdiction. Install bypass type meter at each device.

Install hose bibbs with integral or field-installed vacuum breaker.

Install wall hydrants with integral or field-installed vacuum breaker.

Install trap seal primer valves with valve outlet piping pitched down toward drain trap a minimum of 1/8 inch per foot (1 percent) and connect to floor drain body, trap, or inlet fitting. Adjust valve for proper flow.

Install cleanouts in above-ground piping and building drain piping as indicated, and where not

indicated, according to the following:

Size same as drainage piping up to 4-inch size. Use 4-inch size for larger drainage piping except where larger size cleanout is indicated.

Locate at each change in direction of piping greater than 45 degrees.

Locate at minimum intervals of 50 feet for piping 4 inches and smaller and 100 feet for larger piping.

Locate at base of each vertical soil or waste stack.

Install cleanout deck plates (covers), of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.

Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.

Install flashing flange and clamping device with each stack and cleanout passing through floors having waterproof membrane.

Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to the manufacturer's written instructions.

Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

3.02 FLOOR DRAIN INSTALLATION

Install floor drains according to manufacturer's written instructions, in locations indicated.

Set tops of drains flush with finished floor.

Trap drains connected to sanitary building drain.

Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.

Position drains for easy accessibility and maintenance.

3.03 ROOF DRAIN INSTALLATION

Install roof drains at low points of roof areas, according to the roof membrane manufacturer's installation instructions.

Install drain flashing collar or flange so no leakage occurs between roof drain and adjoining roofing.

Maintain integrity of waterproof membranes, where penetrated.

Position roof drains for easy accessibility and maintenance.

3.04 CONNECTIONS

Supply Runouts to Fixtures: Install hot- and cold-water supply piping runouts to fixtures of sizes indicated, but not smaller than required by plumbing code.

Drainage Runouts to Fixtures: Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but not smaller than required by plumbing code.

Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

3.05 COMMISSIONING

Preparation: Perform the following checks before start-up:

Systems tests are complete.

Damaged and defective specialties and accessories have been replaced or repaired.

There is clear space for servicing of specialties.

Before operating systems, perform these steps:

Close drain valves, hydrants, and hose bibbs.

Open valves to full open position.

Remove and clean strainers.

Verify drainage and vent piping are clear of obstructions. Flush with water until clear.

Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturer, proceed as follows:

3.06 ADJUSTING

Adjust operation and correct deficiencies discovered during commissioning.

3.07 DEMONSTRATION

Train Owner's maintenance personnel on procedures related to startup and servicing of interceptors.

3.08 PROTECTION

Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

Place plugs in ends of uncompleted piping at end of day or when work stops.

END OF SECTION 221119

SECTION 221120

PLUMBING VALVES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Specification Sections.

Product data, including body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions.

1.03 DELIVERY, STORAGE, AND HANDLING

Preparation For Transport: Prepare valves for shipping as follows:

Ensure valves are dry and internally protected against rust and corrosion.

Protect valve ends against damage to threads, flange faces, and weld-end preps.

Set valves in best position for handling. Set globe and gate valves closed to prevent rattling; set ball and plug valves open to minimize exposure of functional surfaces; set butterfly valves closed or slightly open; and block swing check valves in either closed or open position.

Storage: Use the following precautions during storage:

Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.

Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.

Handling: Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels and stems as lifting or rigging points.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, those listed in valve schedule.

Manufacturer: Subject to compliance with requirements, provide products from one of the manufacturers listed in valve schedule.

2.02 VALVE FEATURES, GENERAL

Valve Design: Rising stem or rising outside screw and yoke stems.

Pressure and Temperature Ratings: As scheduled and required to suit system pressures and temperatures.

Sizes: Same size as upstream pipe, unless otherwise indicated.

End Connections: As indicated in the valve specifications.

Threads: Comply with ANSI B1.20.1.

Solder-Joint: Comply with ANSI B16.18.

Caution: Where soldered end connections are used, use solder having a melting point below 840 deg F for gate, globe, and check valves; below 421 deg F for ball valves.

2.03 GATE VALVES

Gate Valves, 2-Inch and Smaller: MSS SP-80; Class 125, body and bonnet of ASTM B 62 cast bronze; with threaded or solder ends, solid disc, copper-silicon alloy stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Provide Class 150 valves meeting the above where system pressure requires.

2.04 BALL VALVES

Ball Valves, 1 Inch and Smaller: Rated for 150 psi, 4two-piece construction; with bronze body conforming to ASTM B 62, standard (or regular) port, chrome-plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout-proof stem, and vinyl-covered steel handle. Provide solder ends for condenser water, chilled water, and domestic hot and cold water service; threaded ends for heating hot water and low-pressure steam.

Ball Valves, 1-1/4-Inch to 2-Inch: Rated for 150 psi; 3-piece construction; with bronze body conforming to ASTM B 62, conventional port, chrome-plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout proof stem, and vinyl-covered steel handle. Provide solder ends for condenser water, chilled water, and domestic hot and cold water service; threaded ends for heating hot water and low-pressure steam.

2.05 PLUG VALVES

Plug Valves, 2-Inch and Smaller: Rated at 150 psi WOG; bronze body, with straightaway pattern, square head, and threaded ends.

Plug Valves, 2-1/2-Inch and Larger: MSS SP-78; rated at 175 psi WOG; lubricated plug type, with semi steel body, single gland, wrench operated, and flanged ends.

2.06 GLOBE VALVES

Globe Valves, 2-Inch and Smaller: MSS SP-80; Class 125; body and screwed bonnet of ASTM B 62 cast bronze; with threaded or solder ends, brass or replaceable composition disc, copper-silicon alloy stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Provide Class 150 valves meeting the above where system pressure requires.

2.07 CHECK VALVES

Swing Check Valves, 2-Inch and Smaller: MSS SP-80; Class 125, cast-bronze body and cap conforming to ASTM B 62; with horizontal swing, Y-pattern, and bronze disc; and having threaded or solder ends. Provide valves capable of being reground while the valve remains in the line. Provide Class 150 valves meeting the above specifications, with threaded end connections, where system pressure requires or where Class 125 valves are not available.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine valve interior through the end ports for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.

Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.

Examine threads on both the valve and the mating pipe for form (i.e., out-of-round or local indentation) and cleanliness.

Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.

Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.

Replace defective valves with new valves.

3.02 VALVE ENDS SELECTION

Select valves with the following ends or types of pipe/tube connections:

Copper Tube Size, 2-Inch and Smaller: Solder ends.

3.03 VALVE INSTALLATIONS

General Application: Use gate, ball, and butterfly valves for shut-off duty; globe, ball, and butterfly for throttling duty. Refer to piping system specification sections for specific valve applications and arrangements.

Locate valves for easy access and provide separate support where necessary.

Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.

Install valves in horizontal piping with stem at or above the center of the pipe.

Install valves in a position to allow full stem movement.

Installation of Check Valves: Install for proper direction of flow as follows:

Swing Check Valves: Horizontal position with hinge pin level.

3.04 SOLDER CONNECTIONS

Cut tube square and to exact lengths.

Clean end of tube to depth of valve socket with steel wool, sand cloth, or a steel wire brush to a bright finish. Clean valve socket in same manner.

Apply proper soldering flux in an even coat to inside of valve socket and outside of tube.

Open gate and globe valves to full open position.

Remove the cap and disc holder of swing check valves having composition discs.

Insert tube into valve socket, making sure the end rests against the shoulder inside valve. Rotate tube or valve slightly to ensure even distribution of the flux.

Apply heat evenly to outside of valve around joint until solder will melt upon contact. Feed solder until it completely fills the joint around tube. Avoid hot spots or overheating valve. Once the solder starts cooling, remove excess amounts around the joint with a cloth or brush.

3.05 THREADED CONNECTIONS

Note the internal length of threads in valve ends, and proximity of valve internal seat or wall, to determine how far pipe should be threaded into valve.

Align threads at point of assembly.

Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).

Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.06 FIELD QUALITY CONTROL

Tests: After piping systems have been tested and put into service, but before final adjusting and balancing, inspect valves for leaks. Adjust or replace packing to stop leaks; replace valves if leak persists.

3.07 ADJUSTING AND CLEANING

Cleaning: Clean mill scale, grease, and protective coatings from exterior of valves and prepare valves to receive finish painting or insulation.

3.08 VALVE PRESSURE/TEMPERATURE CLASSIFICATION SCHEDULES

VALVES, 2-INCH AND SMALLER

SERVICE	GATE	GLOBE	BALL	CHECK
---------	------	-------	------	-------

Domestic Hot and Cold Water	125	125	150	125
-----------------------------	-----	-----	-----	-----

VALVES, 2-1/2-INCH AND LARGER

SERVICE	GATE	GLOBE	CHECK
---------	------	-------	-------

Domestic Hot and Cold Water	125	125	125
-----------------------------	-----	-----	-----

VALVE SCHEDULE

Gate Valves - 2 Inch and Smaller:

MANUFACTURER	THREADED		SOLDER	
	NRS	RS	NRS	RS
Crane	438	428	1701S	1700S
Grinnell	3000	3010	3000SJ	3010SJ
Jenkins	370	47	1240	1242
Nibco	T113	T111	S113	S111
Stockham	B103	B-100	B-104	B-108

Gate Valves - 2 Inch and Smaller:

MANUFACTURER	THREADED		SOLDER	
	NRS	RS	NRS	RS
Crane	x	431UB	x	x
Grinnell	3050	3060	x	x
Jenkins	x	47U	x	x
Nibco	T-136	T-135	S-136	x
Stockham	B-130	B-120	x	B-124

x means not available.

Gate Valves - 2-1/2 Inch and Larger:

MANUFACTURER	OS&Y RS	NRS
Crane	465-1/2	461
Grinnell	6020A	6060A
Jenkins	651A	326
Nibco	617-O	F-619
Stockham	G623	G-612

Ball Valves - 1 Inch and Smaller:

MANUFACTURER	THREADED ENDS	SOLDER ENDS
Apollo	70-100	70-200
Jenkins	900T	902T

Nibco	T-580	S-580
Watts	B-6000	B-6001

x means not available.

Ball Valves - 1-1/4 Inch to 2 Inch:

MANUFACTURER	THREADED ENDS	SOLDER ENDS
Apollo	82-100	82-200
Grinnell	3810	3810SJ
Nibco	T-590-Y	S-590-Y
Watts	B-6800	B-6801

Plug Valves - 2 Inch and Smaller:

Lunkenheimer: 454.

Plug Valves - 2-1/2 Inch and Larger:

Powell: 2201.

Globe Valves - 2 Inch and Smaller:

MANUFACTURER	CLASS 125 THREADED	CLASS 150 SOLDER	THREADED
Crane	1	1310	17TF
Grinnell	3210	3210SJ	3240
Jenkins	746	1200	106-A-2
Nibco	T-211-B	S-211-B	T-235-Y

Globe Valves - 2-1/2 Inch and Larger:

MANUFACTURER	STRAIGHT BODY	ANGLE BODY
Crane	351	353
Grinnell	6200A	x
Jenkins	613	x
Nibco	F-718-B	F-818-B
Stockham	G-512	G-515

x means not available.

Swing Check Valves - 2 Inch and Smaller:

MANUFACTURER	CLASS 125	CLASS 150	
	THREADED ENDS	SOLDER ENDS	THREADED ENDS
Crane	37	1342	137
Grinnell	3300	3300SJ	3320
Jenkins	92-A	1222	92-A
Nibco	T-413	S-413	T-433
Stockham	B-319	B-309	B-321

Swing Check Valves - 2-1/2 Inch and Larger:

MANUFACTURER	CLASS 125	CLASS 175
Crane	373	x
Grinnell	6300A	x
Jenkins	x	729
Nibco	F-918	x
Stockham	G-931	G-940

x means not available.

END OF SECTION 221120

SECTION 221316

PLUMBING SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for the following plumbing piping products:

Couplings and fittings for hubless cast-iron pipe and fittings.

Couplings and fittings for threaded and soldered copper tube, brass and copper fittings.

Coordination drawings, drawn accurately to scale and coordinating penetrations.

1.03 QUALITY ASSURANCE

Comply with the provisions of the New York City Building and Plumbing Code for materials, products, and installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Charlotte
Tyler
Approved Equal

2.02 PIPES AND TUBES

General: The application of the following pipe, tube, and fitting materials and joining methods

required for plumbing piping systems are indicated in Part 3 Article "Pipe and Fittings Applications."

Hubless, Cast-Iron Soil Pipe: CISPI 301.

Poly Vinyl Chloride (PVC) Plastic Water Pipe and Poly Vinyl Chloride (PVC) Plastic DWV Pipe are **prohibited** in accordance with the New York City Fire Department regulations. .

2.03 PIPE FITTINGS AND TUBE FITTINGS

Hub and Spigot, Cast-Iron Soil Pipe Fittings: ASTM A 74, Service Class.

Hubless, Cast-Iron Soil Pipe Fittings: CISPI 301.

2.04 JOINING MATERIALS

Cast-Iron Soil Pipe and Fittings: ASTM C 564 neoprene rubber gaskets and lubricant.

Cast-Iron, Heavy-Duty Couplings for Hubless Cast-Iron Soil Pipe and Fittings: ASTM C 564 neoprene sealing gasket, with cast-iron housing and stainless steel bolts.

PART 3 - EXECUTION

3.01 PIPE AND FITTINGS APPLICATIONS

General: Use pipe, tube, fittings, and joining methods for piping systems according to the following applications.

Soil, Waste, and Vent Piping Above Ground: Use the following:

6 Inches and smaller: Hubless cast-iron soil pipe; hubless cast-iron soil pipe fittings;

Storm Drainage Piping Above Ground: Use the following:

6 Inches and smaller: Hubless cast-iron soil pipe; hubless cast-iron soil pipe fittings;

3.02 PIPING INSTALLATION, GENERAL

Basic piping installation requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."

3.03 DRAINAGE AND VENT PIPING INSTALLATION

Install cast-iron soil pipe and cast-iron soil pipe fittings according to CISPI 1990 revised and edited edition of "Cast Iron Soil Pipe and Fittings Handbook, Volume I," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

Make changes in direction for drainage and vent piping using appropriate Y branches, Y branches with 1/8 bends, and long-sweep 1/4, 1/5, 1/6, 1/8, and 1/16 bends. Sanitary tees and short-sweep quarter bends may be used on vertical stacks of drainage lines where change in direction of flow is from horizontal to vertical. Use long-turn double-Y-branch and 1/8-bend fittings where 2 fixtures are installed back to back or side by side and have a common drain. Straight tees, elbows, and crosses may be used on vent lines. Make no change in direction of flow greater than 90 degrees. Where different sizes of drainage pipes and fittings are connected, use proper size standard increasers and reducers. Reduction of the size of drainage piping in the direction of flow is prohibited.

Lay buried building drains beginning at low point of each system, true to grades and alignment indicated, with unbroken continuity of invert. Place hub or bell ends of piping facing upstream. Install required gaskets according to manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Maintain swab or drag in piping and pull past each joint as completed.

Install drainage and vent piping at the following minimum slopes, except where another slope is indicated:

Sanitary Building Drain: 1/8 inch per foot (1 percent) for piping 4 inches and larger.

Horizontal Sanitary Drainage Piping: 1/8 inch per foot (1 percent).

Storm Building Drain: 1/8 inch per foot (1 percent).

Horizontal Storm Drainage Piping: 1/8 inch per foot (1 percent).

Vent Piping: 1/8 inch per foot (1 percent).

3.04 JOINT CONSTRUCTION

Basic piping joint construction is specified in Division 15 Section "Basic Mechanical Materials and Methods."

Hubless Joint: Make with neoprene gasket and sleeve or clamp.

3.05 HANGERS AND SUPPORTS INSTALLATION

Hanger and support devices are specified in Division 15 Section "Supports and Anchors."

Install hangers for horizontal piping with following maximum spacing and minimum rod sizes:

Nom. Pipe Size (Inches)	Cast-iron Pipe Max. Span (Feet)	Copper Tube Max. Span (Feet)	Min. Rod Diameter (Inches)
Up to 3/4	7	5	3/8
1	7	6	3/8
1-1/4	7	7	3/8
1-1/2	9	8	3/8
2	10	8	3/8
2-1/2	11	9	1/2
3	12	10	1/2
3-1/2	13	11	1/2
4	14	12	5/8, 1/2 for copper

Support vertical pipe and copper tube at each floor.

Conform to table below for maximum spacing of supports:

Pipe Material	Horizontal In Feet	Vertical In Feet
Cast-Iron Soil Pipe	5	15

Pipe Attachments: Install the following:

Riser Clamps: MSS Type 8 or Type 42 for vertical runs.

Adjustable Steel Clevis Hangers: MSS Type 1 for individual straight horizontal runs 100 feet and less.

Adjustable Roller Hangers: MSS Type 43 for individual straight horizontal runs longer than 100 feet.

Support cast-iron soil pipe and fittings not included in table, at maximum horizontal spacing of 5 feet, except 10-foot sections of pipe may be supported at 10-foot spacing and at maximum vertical spacing of 15 feet.

3.06 CONNECTIONS

Drainage Runouts to Fixtures: Provide drainage and vent piping runouts, with approved trap, of sizes indicated, but not smaller than required by plumbing code, to plumbing fixtures and drains.

Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

Mechanical Equipment Connections: Connect hot- and cold-water supply piping system to mechanical equipment as indicated. Provide shutoff valve and union for each connection; provide drain valve on drain connection.

3.07 FIELD QUALITY CONTROL

Inspect drainage piping as follows:

Do not enclose, cover, or put into operation drainage and vent piping system until it has been inspected and approved by the authority having jurisdiction.

During progress of installation, notify the plumbing official having jurisdiction at least 24 hours prior to time such inspection must be made. Perform tests specified below in presence of the plumbing official.

Roughing-In Inspection: Arrange for inspection of piping system after system roughing-in, before concealing, and prior to setting fixtures.

Final Inspection: Arrange for final inspection by plumbing official to observe tests specified below and to ensure compliance with requirements of plumbing code.

Reinspections: Make required corrections and arrange for reinspection by plumbing official when piping system fails to pass test or inspection.

Reports: Prepare inspection reports signed by the plumbing official.

Drainage and Vent Piping System Tests: Test drainage and vent systems according to procedures of authority having jurisdiction or, in absence of published procedure, as follows:

Test for leaks and defects in new drainage and vent piping systems and parts of existing systems that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.

Leave uncovered and unconcealed in new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose for testing work that has been covered or concealed before it has been tested and approved.

Rough Plumbing Test Procedure: Except for outside leaders and perforated or open-jointed drain tile, test piping of plumbing drainage and venting systems on completion of roughing-in piping installation. Tightly close all openings in piping system and fill with water to point of overflow, but not less than 10 feet head of water. Water level shall not drop during the period from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.

Finished Plumbing Test Procedure: After plumbing fixtures have been set and their traps filled with water, test connections and prove gastight and watertight. Plug stack openings on roof and building drain where it leaves the building and introduce air into the system equal to pressure of 1-inch water column. Use a U tube or manometer inserted in the trap of a water closet to measure this pressure. Air pressure shall remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

Repair leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.

Prepare reports for tests and required corrective action.

3.08 PROTECTION

Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

Place plugs in ends of uncompleted piping at end of day or when work stops.

END OF SECTION 221316

SECTION 221616

NATURAL GAS PIPING SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

Product data for each type of natural gas specialty and special-duty valve. Include pressure rating in psig, rated capacity in cu. ft. per hour (CFH), and settings of selected models.

Coordination drawings for natural gas piping systems, including required clearances and relationship to other services that serve the same work areas.

Test reports specified in "Field Quality Control" Article in Part 3.

1.03 QUALITY ASSURANCE

Comply with NFPA 54 "National Fuel Gas Code" for gas piping materials and components; installations; and inspection, testing, and purging.

Comply with New York City Building, Plumbing, Fire Prevention and Uniform Building Codes.

Comply with Con Edison Utility company requirements and regulations.

1.04 SEQUENCING AND SCHEDULING

Work Interruptions: Leave gas systems in a safe condition when interruptions in work occur while repairs or alterations are being made to existing gas piping systems.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Low-Pressure Gas Stops:

Hammond Valve Corp.
Jomar International, Ltd.
Lancaster by National Meter Parts, Inc.
A.Y. McDonald Mfg. Co.
Rockford-Eclipse Div., Eclipse, Inc.
Or approved equal.

Gas Valves, 2 Inches and Smaller:

Homestead by Olson Technologies, Inc.
Lancaster by National Meter Parts, Inc.
Lunkenheimer Co.
A.Y. McDonald Mfg. Co.
Milliken Valve Co., Inc.
Mueller Co., A Grinnell Co.
Mueller Steam Specialty Div., Core Industries, Inc.
Nordstrum Valves, Inc.
Resun by J.M. Huber Corp., Equipment Div.
Rockford-Eclipse Div., Eclipse, Inc.
Or approved equal.

Solenoid Valves:

Atkomatic Valve Co., Inc.
Automatic Switch Co.
Magnatrol Valve Corp.
Skinner Valve Div., Honeywell, Inc.
Or approved equal.

2.02 PIPES AND TUBES

Steel Pipe: ASTM A 53, Type E, Electric-Resistance Welded or Type S, Seamless, Grade B, Schedule 40, black.

2.03 PIPE AND TUBE FITTINGS

Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threads conforming to ASME B1.20.1.

Unions: ASME B16.39, Class 150, black malleable iron; female pattern; brass-to-iron seat; ground

joint.

Cast-Iron Fittings: ASME B16.1, Classes 125 and 250.

2.04 JOINING MATERIALS

Common Joining Materials: Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.

Joint Compound and Tape: Suitable for natural gas.

2.05 VALVES

Manual Valves: Conform to standards listed, or where appropriate, valves according to ANSI Z21.15 and ANSI Z21.15a.

Low-Pressure Gas Stops, 2 Inches and Smaller: AGA-certified design for 2 psig or less natural gas, with AGA stamp, plug or ball type, bronze body and bronze plug or chrome-plated brass ball. Include flat head, square head, or lever handle and threaded ends.

Gas Valves, 2 Inches and Smaller: ASME B16.33, 150 psi WOG, bronze body, bronze plug, straightaway pattern, square head, tapered-plug type, with threaded ends.

Gas Valves, 2 Inches and Smaller: ASME B16.33, 125 psi WOG, cast-iron body, bronze plug, straightaway pattern, square head, tapered-plug type, with threaded ends.

Gas Valves, 2 Inches and Smaller: 125 psi WOG minimum, equivalent to ASME B16.33, lubricated, straightaway pattern, cast-iron or ductile-iron body. Include tapered plug, O-ring seals, square or flat head, and threaded ends.

Option: Include locking (tamperproof) device feature.

Gas Valves, 2 Inches and Smaller: 125 psi WOG minimum, equivalent to ASME B16.33, nonlubricated plug type with PTFE lining or sleeve, straightaway pattern, cast-iron body. Include square or flat head and threaded ends.

Option: Include locking (tamperproof) device feature.

Gas Valves, 2-1/2 Inches and Larger: MSS SP-78, Class 125 or 175 WOG, lubricated plug type, semisteel body, wrench operated, with flanged ends.

Option: Include locking (tamperproof) device feature.

Gas Valves, 2-1/2 Inches and Larger: MSS SP-78, Class 125 or 175 WOG, nonlubricated plug

type with PTFE lining or sleeve, semisteel body, wrench operated, with flanged ends.

Option: Include locking (tamperproof) device feature.

Solenoid Valves: Bronze, aluminum, or cast-iron body; 120 volts a.c., 60 Hz, Class B continuous-duty molded coil; UL labeled and FM approved. Include ISC 6, NEMA 4 coil enclosure and electrically opened and electrically closed dual coils. Valve position is normally closed. Include threaded ends for 2 inches and smaller and flanged ends for 2-1/2 inches and larger.

2.06 PIPING SPECIALTIES

Gas Meters: To be provided by the Utility Company.

Gas Meter Bars: To comply with Con Edison requirements for meter type.

Flexible Connectors: ANSI Z21.24 or ANSI Z21.24a, copper alloy.

PART 3 - EXECUTION

3.01 PREPARATION

Precautions: Close equipment shutoff valves before turning off gas to the premises or section of piping. Perform leakage test as specified in "Field Quality Control" Article to determine that all equipment is turned off in the piping section to be affected.

Comply with NFPA 54 "Prevention of Accidental Ignition."

3.02 EXCAVATION

Excavation, trenching, and backfilling is specified in Division 2 Section "Earthwork."

3.03 PREPARATION OF FOUNDATION FOR BURIED PIPING

Grade trench bottom to provide smooth, firm, stable, and rock-free foundation throughout length of piping.

Remove unstable, soft, and unsuitable materials at surface on which piping is to be laid, and backfill with clean sand or pea gravel to indicated level.

Shape bottom of trench to fit bottom of piping. Fill unevenness with tamped-sand backfill. Dig bell

holes at each pipe joint to relieve bells of loads and to ensure continuous bearing of pipe barrel on foundation.

3.04 SERVICE ENTRANCE PIPING

Extend natural gas piping and connect to gas distribution system (gas service) piping in location and size indicated for gas service entrance to building.

Gas distribution system piping, gas meter will be provided by gas utility.

Include gas distribution system piping to point indicated.

Include gas distribution system piping to point indicated, gas service pressure regulator, and gas meter. Install in piping and specialty arrangement indicated.

Install buried gas distribution system piping with 2 feet minimum cover.

Install shutoff valve, downstream of gas meter, outside building at gas service entrance.

3.05 PIPE APPLICATIONS

General: Flanges, unions, transition and special fittings, and valves with pressure ratings same or higher than system pressure rating may be used in applications below, except where specified otherwise.

Low-Pressure Natural Gas Systems, above Ground within Building: Use the following:

Steel pipe, malleable-iron, threaded fittings, and threaded joints.

3.06 VALVE APPLICATIONS

Use low-pressure gas stops, tapered plug or ball type, for shutoff to appliances with 2-inch or smaller low-pressure gas supply.

Use gas valves for shutoff to appliances.

Use gas valves of sizes indicated for gas service piping, meters, mains, and where indicated.

Use plastic gas valves on plastic gas distribution piping. Install on buried piping with valve box.

3.07 JOINT CONSTRUCTION

Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

Use materials suitable for natural gas service.

Brazed Joints: Make joints with brazing alloy having melting point greater than 1000 deg F (538 deg C). Brazing alloys containing phosphorus are prohibited.

3.08 PIPING INSTALLATIONS

Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation requirements.

Concealed Locations: Except as specified below, install concealed gas piping in an air-tight conduit constructed of Schedule 40 seamless black steel with welded joints. Vent conduit to the outside and terminate with a screened vent cap.

Above-Ceiling Locations: Gas piping may be installed in accessible above-ceiling spaces (subject to approval of the authority having jurisdiction), whether or not such spaces are used as a plenum. Do not locate valves in such spaces.

In Floors: Gas piping with welded joints and protective wrapping specified in "Protective Coating" Article in Part 2 may be installed in floors, subject to approval of authority having jurisdiction. Surround piping cast in concrete slabs with a minimum of 1-1/2 inches of concrete. Piping may not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Do not embed piping in concrete slabs containing quick-set additives or cinder aggregate.

In Floor Channels: Gas piping may be installed in floor channels (subject to approval of authority having jurisdiction). Channels must have cover and be open to space above cover for ventilation.

In Partitions: Do not install concealed piping in solid partitions. Protect tubing against physical damage when it is installed inside partitions or hollow walls. This does not apply to tubing passing through partitions or walls.

In Walls: Gas piping with welded joints and protective wrapping specified in "Protective Coating" Article in Part 2 may be installed in masonry walls (subject to approval of authority having jurisdiction).

Prohibited Locations: Do not install gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts. This does not apply to accessible above-ceiling space specified above.

Drips and Sediment Traps: Install drips at points where condensate may collect. Include outlets of gas meters. Locate where readily accessible to permit cleaning and emptying. Do not install where

condensate would be subject to freezing.

Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use minimum-length nipple of 3 pipe diameters, but not less than 3 inches long, and same size as connected pipe. Install with space between bottom of drip and floor for removal of plug or cap.

Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels, except where indicated to be exposed to view.

Install gas piping at a uniform grade of 1/4 inch in 15 feet, upward toward risers. Install piping upward from service risers to meters, service regulator when meter is not provided, and equipment.

Make reductions in pipe sizes using eccentric reducer fittings installed with the level side down.

Connect branch piping from top or side of horizontal piping.

Install unions in pipes 2 inches and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated. Unions are not required on flanged devices.

Install dielectric fittings (unions and flanges) with 1 ferrous and 1 brass or bronze-end connections, separated by insulating material, where piping of dissimilar metals are joined.

Install dielectric fittings (unions and flanges) with 2 ferrous end connections, separated by insulating material, at outlet from gas meter and, where indicated, for ferrous piping.

Install flanges on valves, specialties, and equipment having 2-1/2-inch and larger connections.

Install strainers on the supply side of each control valve, gas pressure regulator, solenoid valve, and elsewhere as indicated.

Anchor piping to ensure proper direction of piping expansion and contraction. Install expansion joints, expansion loops, and pipe guides as indicated.

Install vent piping for gas pressure regulators and gas trains, extend outside building, and vent to atmosphere. Terminate vents with turned-down, reducing elbow fittings with corrosion-resistant insect screens in large end.

Install containment conduits for buried gas piping within building in gas-tight conduits extending 4 inches minimum outside building and vented to atmosphere. Terminate vents with turned-down, reducing elbow fittings with corrosion-resistant insect screens in large end. Prepare and paint outside of conduits with coal tar epoxy-polyamide paint according to SSPC Paint 16.

Install underground plastic gas distribution piping according to ASTM D 2774.

3.09 HANGER AND SUPPORT INSTALLATION

Refer to Division 15 Section "Supports and Anchors" for hanger and support devices.

Install hangers for horizontal piping with following maximum spacing and minimum rod sizes:

Nominal Steel Pipe Pipe Size (Inches)	Max. Span	Copper Tube Max. Span (Feet)	Min. Rod Diameter (Feet)	(Inches)
3/8 -		4	3/8	
1/2 6		6	3/8	
5/8 -		6	3/8	
3/4 8		7	3/8	
7/8 -		7	3/8	
1 8		8	3/8	
1-1/4		9	9	3/8
1-1/2 to 2		10	10	3/8
2-1/2 to 3-1/2		10	10	1/2
4 -		10	1/2	
4 and Larger		10	-	5/8

Support vertical steel pipe and copper tube at each floor.

3.10 VALVE INSTALLATION

Install valves in accessible locations, protected from physical damage. Tag valves with a metal tag attached with a metal chain indicating the piping systems supplied.

Install a gas valve upstream of each gas pressure regulator. Where two gas pressure regulators are installed in series in a single gas line, a manual valve is not required at the second regulator.

Install pressure-relief or pressure-limiting devices so they can be readily operated to determine if valve is free; test to determine pressure at which they will operate; and examine for leakage when in closed position.

3.11 CONNECTIONS

Install gas piping next to gas-utilizing equipment and appliances to allow servicing and maintenance.

Connect gas piping to gas-utilizing equipment and appliances with shutoff valves and unions. Make connections downstream of valves and unions, with flexible connectors where indicated.

Electrical Connections: Wiring is specified in Division 16.

3.12 TERMINAL EQUIPMENT CONNECTIONS

Install a gas valve upstream and within 6 feet of each gas-utilizing appliance. Install a union or flanged connection downstream from the valve to permit removal of controls.

Sediment Traps: Install tee fittings forming drips, as close as practical to gas appliance inlets. Cap or plug bottom outlet.

3.13 ELECTRICAL BONDING AND GROUNDING

Install above-ground portions of natural gas piping systems that are upstream from equipment shutoff valves, electrically continuous and bonded to a grounding electrode according to NFPA 70.

Do not use gas piping as a grounding electrode.

3.14 FIELD QUALITY CONTROL

Inspect, test, and purge natural gas systems according to NFPA 54, Part 4 "Gas Piping Inspection, Testing, and Purging" and local gas utility requirements.

Repair leaks and defects with new materials, and retest system until satisfactory results are obtained.

Report test results promptly and in writing to the Architect and the authority having jurisdiction.

Verify capacities and pressure ratings of gas meters, regulators, valves, and specialties.

Verify correct pressure settings for pressure regulators.

Verify that specified piping tests are complete.

3.15 ADJUSTING

Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

END OF SECTION 221616

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SECTION 223436

DOMESTIC HOT WATER HEATERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

Requirements of the following Division 22 Sections apply to this section:

"Basic Mechanical Requirements."

"Basic Mechanical Materials and Methods."

1.02 SUMMARY

This Section includes commercial electric and gas-fired hot water heaters.

1.03 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data including rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties, and accessories, and indicating dimensions, required clearances, and methods of assembly of components, and piping and wiring connections.

Wiring diagrams from manufacturers detailing electrical requirements for electrical power supply wiring to water heaters. Include ladder-type wiring diagrams for interlock and control wiring required for final installation of water heaters and controls. Differentiate between portions of wiring that are factory installed and portions that are to be field installed.

Certificates of shop inspection and data report as required by provisions of the ASME Boiler and Pressure Vessel Code.

1.04 QUALITY ASSURANCE

UL Standards: Provide water heaters complying with the following:

UL 174, "Household Electric Storage Tank Water Heaters."

UL 778, "Motor Operated Water Pumps."

UL 1453, "Electric Booster and Commercial Storage Tank Water Heaters."

Electrical Component Standard: Provide components complying with NFPA 70 "National Electrical Code."

Listing and Labeling: Provide water heaters that are listed and labeled.

The terms "listed" and "labeled" shall be as defined in the National Electrical Code, Article 100.

Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

AGA Standards: Provide water heaters that bear the label of the American Gas Association.

ASME Code Compliance: Provide water heaters and safety relief valves that comply with ASME Boiler and Pressure Vessel Code and that bear the appropriate code symbols.

ASHRAE Standards: Provide water heaters with performance efficiencies not less than prescribed in ASHRAE 90A, "Energy Conservation in New Building Design."

Design Concept: The drawings indicate types and capacities of water heaters and are based on specific descriptions and manufacturers indicated. Water heaters having equal performance characteristics by other manufacturers may be considered provided that deviations in capacities, dimensions, operation, or other characteristics are minor and do not change the design concept or intended performance as judged by the Engineer. Burden of proof for equality of water heaters is on the proposer.

1.05 WARRANTY

Special Project Warranty: Submit a written warranty, executed by manufacturer, agreeing to repair or replace water heater units that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, tanks, coils, heat exchangers, and burners. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have against the Contractor under the Contract Documents.

Warranty period is 5 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Commercial Electric Water Heaters:

Rheem Mfg.
Ruud Mfg. Div.; Rheem Mfg.
A.O. Smith Water Products Co. Div.; A.O. Smith Corp.
State Industries, Inc.
Or approved equal.

Commercial Power Gas-Fired Water Heaters:

Rheem Mfg.
Ruud Mfg. Div.; Rheem Mfg.
A.O. Smith Water Products Co. Div.; A.O. Smith Corp.
Or approved equal.

2.02 ELECTRIC WATER HEATERS

Description: Automatic, commercial, electric; with vertical, ASME labeled, 150-psig-rated storage tank, integral controls, drain valve, and relief valve.

Description: Automatic, commercial electric; with horizontal, ASME labeled, 150-psig-rated storage tank, circulating pump, integral controls, drain valve, and relief valve.

Insulation: Fiberglass or polyurethane foam, surrounding tank.

Jacket: Steel, with baked-on enamel finish.

Tank: Glass-lined steel with anode rods and drain valve.

Heating Elements: Screw-in or flanged bolt-in immersion type, in multiples of 3 elements.

Controls: Adjustable immersion thermostat.

Safety Controls: Automatic, high-temperature-limit cutoff and low-water cutoff.

Temperature and Pressure Relief Valve: ASME rated and labeled.

Vacuum Relief Valve: ANSI Z21.22.

Storage Capacity: as noted on drawings.

Minimum Recovery Rate: as noted on drawings.

Electric Input: as noted on drawings.

Electrical Characteristics: 208 VAC, 1 Phase, 60 Hz.

2.03 DIRECT VENT GAS-FIRED WATER HEATERS

Description: Automatic, commercial direct vent gas-fired, with integral controls, with vent termination kit and connecting flue, powered-gas burner, gas train including gas regulator, and relief valve.

Insulation: Fiberglass or manufacturer's option, surrounding tank.

Jacket: Steel, with baked-on enamel finish.

Tank: Glass-lined steel, with anode rods and drain valve.

Controls: Adjustable thermostat.

Safety Controls: Equipped with automatic gas shutoff device to shut off entire gas supply in event of excessive temperature in tank, and pilot safety shutoff.

Burner: Power Direct Vent gas burner.

Temperature and Pressure Relief Valve: ASME rated and labeled.

Vacuum Relief Valve: ANSI Z21.22.

Storage Capacity: as noted on drawings.

Minimum Recovery Rate: as noted on drawings.

Fuel Gas Input: as noted on drawings.

2.04 CONCRETE BASES

Concrete: Portland cement, mix to a 4000-psi, 28-day compressive strength.

Cement: ASTM C 150, Type I.

Fine Aggregate: ASTM C 33, sand.

Coarse Aggregate: ASTM C 33, crushed gravel.

Reinforcement Fabric: ASTM A 185, welded wire fabric, plain.

Reinforcement Bars: ASTM A 615, Grade 60, deformed.

PART 3 - EXECUTION

3.01 CONCRETE BASES

Construct concrete equipment bases, 6 inch wider than water heater.

Form concrete bases having permanent steel frame, using steel channels conforming to ASTM A 36, size and location as indicated. Miter and weld corners and provide cross bracing. Anchor or key to floor slab.

Install reinforcing bars, tied to frame, and place anchor bolts and sleeves using manufacturer's installation template.

Form concrete bases using framing lumber with form release compounds. Chamfer top edges and corners.

Install reinforcing bars, and place anchor bolts and sleeves using manufacturer's installation template.

Place concrete and allow to cure before installation of equipment.

Clean exposed steel frames and apply 2 coats of rust-preventative metal primer and 2 coats of exterior, gloss, alkyd enamel in color selected by the Architect.

3.02 WATER HEATER INSTALLATION

General: Install water heaters on concrete bases. Set and connect units in accordance with manufacturer's written installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances. Orient so controls and devices needing servicing are accessible.

Install thermometers on water heater inlet and outlet piping.

NFPA Compliance: Install gas-fired water heaters in compliance with NFPA 54, "National Fuel Gas Code."

3.03 CONNECTIONS

Piping installation requirements as indicated on the drawings, as per manufacturer's recommendations and as required for proper operation. The Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

Install piping adjacent to equipment arranged to allow servicing and maintenance.

Connect hot and cold water piping to units with shutoff valves and unions. Connect hot water circulating piping to unit with shutoff valve, check valve, and union. Extend relief valve discharge to closest floor drain.

Where water heater piping connections are dissimilar metals, make connections with dielectric fittings or dielectric unions.

Install vacuum relief valve in cold water inlet piping.

Connect gas supply piping to burner with drip leg, tee, gas cock, and union; minimum size same as inlet connection. Arrange piping to allow unit servicing.

Install vent piping from gas train pressure regulators and valves to outside the building. Terminate vent piping with brass screened vent cap fitting. Do not combine vents except with approval of local authority.

Install gas pressure regulators where required.

Install drain as indirect waste to spill into open drain or over floor drain.

Install drain valve at low point in water piping, for water heaters not having tank drain.

Electrical Connections: Power wiring and disconnect switches are specified in Electrical Specifications.

Grounding: Connect unit components to ground in accordance with the National Electrical Code.

Vent Connections: Run direct vent to wall termination kit furnished by unit manufacturer in accordance with manufacturer's written instructions. Unless otherwise indicated provide vent same size as outlet on heater. Comply with gas utility requirements.

3.04 FIELD QUALITY CONTROL

General: Provide the services of a factory-authorized service representative to test and inspect unit

installation, provide start-up service, and demonstrate and train Owner's maintenance personnel as specified below.

Test and adjust operating and safety controls. Replace damaged and malfunctioning controls and equipment.

Train Owner's maintenance personnel on procedures and schedules related to start-up and shutdown, troubleshooting, servicing, and preventative maintenance.

Review data in Operating and Maintenance Manuals. Refer to Division 1 Section "Project Closeout."

Schedule training with at least 7 days, advance notice.

3.05 COMMISSIONING

Perform the following before start-up final checks:

Fill water heaters with water.

Piping systems test complete.

Check for piping connections leaks.

Check for adequate combustion air.

Check for clear vent.

Test operation of safety controls and devices.

Perform the following start-up procedures:

Energize circuits.

Adjust operating controls.

Adjust hot water outlet temperature setting.

END OF SECTION 223436

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SECTION 224200

PLUMBING FIXTURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Specification Sections.

Product data for each type of plumbing fixture specified, including fixture and trim, fittings, accessories, appliances, appurtenances, equipment, supports, construction details, dimensions of components, and finishes.

1.03 QUALITY ASSURANCE

All fixtures shall comply with the requirements of the NYC Building Code, Fire Department regulations and all codes and authorities having jurisdiction.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.

Store plumbing fixtures on elevated platforms in a dry location.

PART 2 - PRODUCTS

Provide plumbing fixtures, trim, fittings, other components, and supports as specified in the "Plumbing Fixture Schedule" on the drawings and in accordance with the FDNY Standards.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine roughing-in for potable cold water and hot water supplies and soil, waste, and vent piping systems to verify actual locations of piping connections prior to installing fixtures.

Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

Do not proceed until unsatisfactory conditions have been corrected.

3.02 APPLICATION

Install plumbing fixtures and specified components, in accordance with designations and locations indicated on Drawings.

Install supports for plumbing fixtures in accordance with categories indicated, and of type required:

Chair carriers for the following fixtures:

Wall-hanging urinals.

Wall-hanging lavatories and sinks.

Wall-hanging water closets.

3.03 INSTALLATION OF PLUMBING FIXTURES

Install plumbing fixtures level and plumb, in accordance with fixture manufacturers' written installation instructions, roughing-in drawings, and referenced standards.

Install floor-mounted, floor-outlet water closets with closet flanges and gasket seals.

Install floor-mounted, back-outlet water closets with fittings and gasket seals.

Install wall-hanging, back-outlet urinals with gasket seals.

Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.

Fasten floor-mounted fixtures and special fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.

Fasten wall-mounted fittings to reinforcement built into walls.

Fasten counter-mounting-type plumbing fixtures to casework.

Secure supplies behind wall or within wall pipe space, providing rigid installation.

Set shower receptors and mop basins in leveling bed of cement grout.

Install stop valve in an accessible location in each water supply to each fixture.

Install trap on fixture outlet except for fixtures having integral trap.

Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork. Use deep pattern escutcheons where required to conceal protruding pipe fittings.

Seal fixtures to walls, floors, and counters using a sanitary-type, one-part, mildew-resistant, silicone sealant in accordance with sealing requirements specified in Division 7 Section "Joint Sealers." Match sealant color to fixture color.

3.04 FIELD QUALITY CONTROL

Inspect each installed fixture for damage. Replace damaged fixtures and components.

Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.

3.05 ADJUSTING AND CLEANING

Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

Operate and adjust disposers, hot water dispensers, and controls. Replace damaged and malfunctioning units and controls.

Adjust water pressure at drinking fountains, electric water coolers, and faucets, shower valves, and flushometers having controls, to provide proper flow and stream.

Replace washers of leaking and dripping faucets and stops.

Clean fixtures, fittings, and spout and drain strainers with manufacturers' recommended cleaning methods and materials.

3.06 PROTECTION

Provide protective covering for installed fixtures and fittings.

Do not allow use of fixtures for temporary facilities, except when approved in writing by the Owner.

END OF SECTION 224200

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SECTION 230501

BASIC MECHANICAL REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

Shop Drawings – shall be as directed by the construction Manager and the DDC General Conditions.

Additional copies may be required by individual sections of these Specifications.

1.03 COORDINATION DRAWINGS

Prepare coordination drawings in accordance with Division 1 section "PROJECT COORDINATION," to a scale of 3/8"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

Indicate the proposed locations of piping, ductwork, equipment, and materials. Include the following:

Clearances for installing and maintaining insulation.

Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.

Equipment connections and support details.

Exterior wall and foundation penetrations.

Fire-rated wall and floor penetrations.

Sizes and location of required concrete pads and bases.

Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings

and their relationship to other penetrations and installations.

Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.04 RECORD DOCUMENTS

Prepare and provide to the Engineer, "AS-Built Drawings" in accordance with DDC standards and as directed by the construction manager.

In addition to the requirements specified in DDC General conditions, indicate the following installed conditions:

Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.

Equipment locations (exposed and concealed), dimensioned from prominent building lines.

Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.05 MAINTENANCE MANUALS

Prepare maintenance manuals in accordance with Section "PROJECT CLOSEOUT" and in according to the requirements of the DDC.

Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.

Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

Servicing instructions and lubrication charts and schedules.

1.06 DELIVERY, STORAGE, AND HANDLING

Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.01 ROUGH-IN:

Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

3.02 MECHANICAL INSTALLATIONS

General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

Coordinate mechanical systems, equipment, and materials installation with other building components.

Verify all dimensions by field measurements.

Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

Install systems, materials, and equipment level and plumbing, parallel and perpendicular to other building systems and components.

3.03 REFER TO DRAWING COORDINATION CHECKLIST.

Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of

equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are as Section "BASIC MECHANICAL MATERIALS AND METHODS."

Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.04 CUTTING AND PATCHING

General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:

Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

Perform cutting, fitting, and patching of mechanical equipment and materials required to:

Uncover Work to provide for installation of ill-timed Work.

Remove and replace defective Work.

Remove and replace Work not conforming to requirements of the Contract Documents.

Remove samples of installed Work as specified for testing.

Install equipment and materials in existing structures.

Upon written instructions from the Architect, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.

Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.

Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

Refer to Section "DEFINITIONS AND STANDARDS" for definition of "experienced Installer."

END OF SECTION 230501

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SECTION 230502

BASIC MECHANICAL MATERIALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for the following products:

- Access panels and doors.
- Joint sealers.

Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.

Coordination drawings for access panel and door locations in accordance with Division 15 Section "Basic Mechanical Requirements."

Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.

Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services and details for dust and noise control.

Coordinate sequencing with construction phasing and Owner occupancy specified in Division 1 Section "Summary of Work."

1.03 QUALITY ASSURANCE

Installer Qualifications: Engage an experienced Installer for the installation and application joint sealers, access panels, and doors.

Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the UL "Building Materials Directory" for rating shown.

Provide UL Label on each fire-rated access door.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.05 PROJECT CONDITIONS

Conditions Affecting Selective Demolition: The following project conditions apply:

Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.

Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

1.06 SEQUENCE AND SCHEDULING

Coordinate the shut-off and disconnection of utility services with the Owner and the utility company.

PART 2 - PRODUCTS

2.01 MECHANICAL EQUIPMENT NAMEPLATE DATA

Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.02 MISCELLANEOUS METALS

Steel plates, shapes, bars, and bar grating: ASTM A 36.

Cold-Formed Steel Tubing: ASTM A 500.

Hot-Rolled Steel Tubing: ASTM A 501.

Steel Pipe: ASTM A 53, Schedule 40, welded.

Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout, recommended for interior and exterior applications.

Fasteners: Zinc-coated, type, grade, and class as required.

2.03 JOINT SEALERS

General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

Colors: As selected by the Architect from manufacturer's standard colors.

Elastomeric Joint Sealers: Provide the following types:

One-part, nonacid-curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.

One-part, mildew-resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with nonporous substrates; and subject to in-service exposure to conditions of high humidity and temperature extremes.

Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to, the following:

2.04 ACCESS DOORS

Steel Access Doors and Frames: Factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces.

Frames: 16-gage steel, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, pre-cast, or cast-in-place concrete, ceramic tile, or wood paneling.

For installation in masonry, concrete, ceramic tile, or wood paneling: 1 inch-wide-exposed perimeter flange and adjustable metal masonry anchors.

For gypsum wallboard or plaster: perforated flanges with wallboard bead.

For full-bed plaster applications: galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

Flush Panel Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory-applied prime paint.

Fire-Rated Units: Insulated flush panel doors, with continuous piano hinge and self-closing mechanism.

Locking Devices: Flush, screwdriver-operated cam locks.

Locking Devices: Where indicated, provide 5-pin or 5-disc type cylinder locks, individually keyed; provide 2 keys.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Bar-Co., Inc.
J.L. Industries.
Karp Associates, Inc.
Milcor Div. Inryco, Inc.
Nystrom, Inc.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION FOR JOINT SEALERS

Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape immediately after tooling without disturbing joint seal.

3.03 ERECTION OF METAL SUPPORTS AND ANCHORAGE

Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

Field Welding: Comply with AWS "Structural Welding Code."

Attach to substrates as required to support applied loads.

3.04 APPLICATION OF JOINT SEALERS

General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.

Comply with recommendations of ASTM C 790 for use of acrylic- emulsion joint sealants.

Tooling: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials, to fill openings around mechanical services penetrating floors and walls, to provide fire-stops with fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.05 INSTALLATION OF ACCESS DOORS

Set frames accurately in position and securely attached to supports, with face panels plumb and level in relation to adjacent finish surfaces.

Adjust hardware and panels after installation for proper operation.

END OF SECTION 230502

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SECTION 230529

MECHANICAL SUPPORTS AND ANCHORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with conditions of contract and Division 1 specification sections.

Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, location, and features for each required pipe hanger and support.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58.

Components shall have galvanized coatings where installed for piping and equipment that will not have field-applied finish.

Pipe attachments shall have nonmetallic coating or be of nonmetallic materials for electrolytic protection where attachments are in direct contact with copper tubing.

2.02 HORIZONTAL-PIPING HANGERS AND SUPPORTS:

General: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit around piping insulation with saddled or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.

Adjustable Steel Clevis Hangers: MSS Type 1. (239, 100, 260)
For copper: (354, 100 CT, CT-65)

2.03 MISCELLANEOUS MATERIALS

Steel Plates, Shapes, and Bars: ASTM A 36.

Metal Framing: provide products complying with NEMA STD ML 1.

Auxiliary Steel: provide for installation of hangers, supports, anchors, guides, etc. complying with standards of AISC Steel Handbook.

Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.

Universal Trapeze: (N.A., N.A., 46) Tubular carbon steel trapeze with reinforcing plates at each hanger rod hole.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF HANGERS AND SUPPORTS

General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69 and SP-89. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible. Install supports with maximum spacing as indicated in Division-15 Section, "HVAC Hydronic Piping". If not indicated comply with MSS SP-69. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

Provide additional hanger cross bracing secured to structure to restrain lengthy hanger rods and to prevent excessive vertical and horizontal movement of piping due to internal water hammer shock or accidental external mechanical contact.

Provide electrolysis in support of copper tubing by use of hangers and supports which are copper plated.

Hangers for piping 2-1/2" and larger shall be provided with means of vertical adjustment.

Install building attachments within concrete or to structural steel (do not attach to terra cota). Hangers and attachment for piping above 2-1/2" shall load beams concentrically. Space attachments within maximum piping span length as indicated in Division-15 Section "HVAC

Hydronic Piping". If not indicated, comply with MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert to forms. Where concrete with compressive strength less than 2,500 psi is indicated, install reinforcing bars through openings at top of inserts.

Welding of hanger devices to building steel, burning or drilling of building steel and/or ram setting or drilling into concrete or metal roof deck shall not be permitted without written permission of structural engineer.

Hang only from building steel, provide intermediate auxiliary steel to support hanger between steel beams. No loads shall be supported from roof deck.

Piping shall be supported resiliently by using combination spring and neoprene element hangers in the following locations:

Within the Mechanical Equipment Room or within 50 feet of the vibrating equipment, whichever is greater.

Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories. Except as otherwise indicated, for exposed continuous pipe runs install hangers and supports of same type and style as installed for adjacent similar piping.

Field-Fabricated, Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.

Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.

Insulated Piping: Comply with the following installation requirements.

Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

Saddles: Install protection saddles MSS Type 39 at all hanger and support points where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

3.03 EQUIPMENT SUPPORTS

Concrete housekeeping bases will be provided as work of Division 3. Furnish to Contractor, scaled layouts of all required bases, with dimensions of bases, and locations to column center lines. Furnish templates, anchor bolts, and accessories, necessary for base construction.

Furnish roof equipment supports to Contractor for installation as part of work of Division 7; not work of this section.

Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.

Grouting: Place grout under supports for piping and equipment.

3.04 METAL FABRICATION

Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.

Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

3.05 ADJUSTING

Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

Support Adjustment: Provide grout under supports so as to bring piping and equipment to proper level and elevations.

END OF SECTION 230529

SECTION 230548

VIBRATION CONTROL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 INTENT

All mechanical equipment, piping and ductwork shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflections.

All isolators and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer.

It is the intent of the seismic portion of this specification to keep all mechanical and electrical building system components in place during a seismic event.

All such systems must be installed in strict accordance with seismic codes, component manufacturers and building construction standards. Whenever a conflict occurs between the manufacturers or construction standards, the most stringent shall apply.

This specification is considered to be minimum requirements for seismic consideration and is not intended as a substitute for legislated, more stringent, national, state or local construction requirements

Any variance or non-compliance with these specification requirements shall be corrected by the contractor in an approved manner.

Seismic restraints shall be designed in accordance with seismic force levels as directed by the Structural Engineer.

1.03 WORK INCLUDED

The work in this section includes, but is not limited to the following:

Vibration isolation for piping, ductwork and equipment.

Equipment isolation bases.

Flexible piping connections.

Seismic restraints for isolated equipment.

Seismic restraints for non-isolated equipment.

Certification of seismic restraint designs and installation supervision.

Certification of seismic attachment of housekeeping pads.

All mechanical systems. Equipment buried underground is excluded but entry of services through the foundation wall is included. Equipment referred to below is typical. (Equipment not listed is still included in this specification).

AC Units
Fans (All types)
Air Handling Units
Unit Heaters
Condensing Units
Piping
Ductwork
Rooftop Units

1.04 SUBMITTALS:

The manufacturer of vibration isolation and seismic restraints shall provide submittals for products as follows:

Descriptive Data:

Catalog cuts or data sheets on vibration isolators and specific restraints detailing compliance with the specification.

Detailed schedules of flexible and rigidly mounted equipment, showing vibration isolators and seismic restraints by referencing numbered descriptive drawings.

Shop Drawings:

Submit fabrication details for equipment bases including dimensions, structural member sizes and support point locations.

Provide all details of suspension and support for ceiling suspended equipment.

Where walls, floors, slabs or supplementary steel work are used for seismic restraint locations, details of acceptable attachment methods for ducts, conduit and pipe must be included and approved before the condition is accepted for installation. Restraint manufacturers submittals must include spacing, static loads and seismic loads at all attachment and support points.

Provide specific details of seismic restraints and anchors; include number, size and locations for each piece of equipment.

Seismic Certification and Analysis:

Seismic restraint calculations must be provided for all connections of equipment to the structure. Calculations must be stamped by a registered professional engineer with at least five years of seismic design experience, licensed in the state of the job location.

All restraining devices shall have a preapproval number of a recognized government agency showing maximum restraint ratings. Preapprovals based on independent testing are preferred to preapprovals based on calculations. Where preapproved devices are not available, submittals based on independent testing are preferred. Calculations (including the combining of tensile and shear loadings) to support seismic restraint designs must be stamped by a registered professional engineer with at least five years of seismic design experience and licensed in the state of the job location. Testing and calculations must include both shear and tensile loads as well as one test or analysis at 45E to the weakest mode.

Analysis must indicate calculated dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and/or welded length. All seismic restraint devices shall be designed to accept, without failure, the forces detailed in section 1.06 acting through the equipment center of gravity. Overturning moments may exceed forces at ground level.

1.05 MANUFACTURER'S RESPONSIBILITY

Manufacturer of vibration isolation and seismic control equipment shall have the following responsibilities:

- Determine vibration isolation and seismic restraint sizes and locations.

- Provide vibration isolation and seismic restraints as scheduled or specified.

- Provide calculations and materials if required for restraint of unisolated equipment.

- Provide installation instructions, drawings and trained field supervision to insure proper installation and performance.

1.06 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products, of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.

Except as otherwise indicated, obtain vibration control products from single manufacturer.

1.05 RELATED WORK

Housekeeping Pads

Housekeeping pad reinforcement and monolithic pad attachment to the structure details and design shall be prepared by the restraint vendor if not already indicated on the drawings.

Housekeeping pads shall be coordinated with restraint vendor and sized to provide a minimum edge distance of ten (10) bolt diameters all around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings. If cast-in anchors are to be used, the housekeeping pads shall be sized to accommodate the ACI requirements for bolt coverage and embedment.

Supplementary Support Steel

Contractor shall supply supplementary support steel for all equipment, piping, ductwork, etc. including roof mounted equipment, as required or specified.

Attachments

Contractor shall supply restraint attachment plates cast into housekeeping pads, concrete inserts, double sided beam clamps, etc. in accordance with the requirements of the vibration vendor's calculations.

1.06 Seismic Force Levels

Shall be as directed by the Structural Engineer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering vibration control products which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide vibration control products of one of the following:

Mason Industries, Inc. (Model numbers provided for reference)
Vibration Eliminator Co., Inc.
Or approved equal.

Vibration Isolators and Seismic Restraints.

2.02 SPECIFICATION:

1. Two layers of 3/4" thick neoprene pad consisting of 2" square waffle modules separated horizontally by a 16 gauge galvanized shim. Load distribution plates shall be used as required. Pads shall be type **Super AW** as manufactured by Mason Industries, Inc.
2. Bridge-bearing neoprene mountings shall have a minimum static deflection of 0.2" and all directional seismic capability. The mount shall consist of a ductile iron casting containing two separated and opposing molded neoprene elements. The elements shall prevent the central threaded sleeve and attachment bolt from contacting the casting during normal operation. The shock absorbing neoprene materials shall be compounded to bridge-bearing specifications. Mountings shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **BR** as manufactured by Mason Industries, Inc.
3. Sheet metal panels shall be bolted to the walls or supporting structure by assemblies consisting of a neoprene bushing cushioned between 2 steel sleeves. The outer sleeve prevents the sheet metal from cutting into the neoprene. Enlarge panel holes as required. Neoprene elements pass over the bushing to cushion the back panel horizontally. A steel disc covers the inside neoprene element and the inner steel sleeve is elongated to act as a stop so tightening the anchor bolts does not interfere with panel isolation in 3 planes. Bushing assemblies can be applied to the ends of steel cross members where applicable. All neoprene shall be bridge bearing quality. Bushing assemblies shall be type **PB** as manufactured by Mason Industries, Inc.
4. A one piece molded bridge bearing neoprene washer/bushing. The bushing shall surround the anchor bolt and have a flat washer face to avoid metal to metal contact. Neoprene bushings shall be type **HG** as manufactured by Mason Industries, Inc.
5. Spring isolators shall be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4" neoprene acoustical friction pad between the baseplate and the support. All mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include spring diameters, deflection, compressed spring height and solid spring height. Mountings shall be type **SLF** as manufactured by Mason Industries, Inc.
6. Restrained spring mountings shall have an SLF mounting as described in Specification 5,

within a rigid housing that includes vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Restraining Bolts shall have a neoprene bushing between the bolt and the housing. Limit stops shall be out of contact during normal operation. Since housings will be bolted or welded in position there must be an internal isolation pad. Housing shall be designed to resist all seismic forces. Mountings shall have Anchorage Preapproval .OPA. Number from OSHPD in the state of California certifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SLR** or **SLRS** as manufactured by Mason Industries, Inc.

7. Spring mountings as in specification 5 built into a ductile iron or steel housing to provide all directional seismic snubbing. The snubber shall be adjustable vertically and allow a maximum of 1/4" travel in all directions before contacting the resilient snubbing collars. Mountings shall have an Anchorage Preapproval .OPA. number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Mountings shall be type **SSLFH** as manufactured by Mason Industries, Inc.

8. Air Springs shall be manufactured with upper and lower steel sections connected by a replaceable flexible nylon reinforced neoprene element. Air spring configuration shall be multiple bellows to achieve a maximum natural frequency of 3 Hz. Air Springs shall be designed for a burst pressure that is a minimum of three times the published maximum operating pressure. All air spring systems shall be connected to either the building control air or a supplementary air supply and equipped with three leveling valves to maintain leveling within plus or minus 1/8". Submittals shall include natural frequency, load and damping tests performed by an independent lab or acoustician. Air Springs shall be type **MT** and leveling valves type **LV** as manufactured by Mason Industries, Inc.

9. Restrained air spring mountings shall have an MT air spring as described in Specification 8, within a rigid housing that includes vertical limit stops to prevent air spring extension when weight is removed. The housing shall serve as blocking during erection. A steel spacer shall be removed after adjustment. Installed and operating heights are equal. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the air spring so as not to interfere with the air spring action. Limit stops shall be out of contact during normal operation. Housing shall be designed to resist all seismic forces. Mountings shall be type **SLR-MT** as manufactured by Mason Industries, Inc.

10. Hangers shall consist of rigid steel frames containing minimum 1 1/4" (32mm) thick neoprene elements at the top and a steel spring with general characteristics as in specification 5 seated in a steel washer reinforced neoprene cup on the bottom. The neoprene element and the cup shall have neoprene bushings projecting through the steel box. To maintain stability the boxes shall not be articulated as clevis hangers nor the neoprene element stacked on top of the spring. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30E arc from side to side before contacting the rod bushing and short circuiting the spring. Submittals shall include a hanger drawing showing the 30E capability. Hangers shall

be type **30N** as manufactured by Mason Industries, Inc.

10A. Hangers shall be as described in 10, but they shall be supplied with a combination rubber and steel rebound washer as the seismic upstop for suspended piping, ductwork, equipment and electrical cabletrays. Rubber thickness shall be a minimum of 1/4". Submittals shall include a drawing of the hanger showing the installation of the rebound washer. Hangers shall be type **RW30N** as manufactured by Mason Industries, Inc.

11. Hangers shall be as described in 10, but they shall be precompressed and locked at the rated deflection by means of a resilient seismic upstop to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a drawing of the hanger showing the 30E capability. Hangers shall be type **PC30N** as manufactured by Mason Industries, Inc.

12. Seismic Cable Restraints shall consist of galvanized steel aircraft cables sized to resist seismic loads with a minimum safety factor of two and arranged to provide all-directional restraint. Cables must be prestretched to achieve a certified minimum modulus of elasticity. Cable end connections shall be steel assemblies that swivel to final installation angle and utilize two clamping bolts to provide proper cable engagement. Cables must not be allowed to bend across sharp edges. Cable assemblies shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified load ratings. Cable assemblies shall be type **SCB** at the ceiling and at the clevis bolt, **SCBH** between the hanger rod nut and the clevis or **SCBV** if clamped to a beam, all as manufactured by Mason Industries, Inc.

13. Seismic solid braces shall consist of steel angles or channels to resist seismic loads with a minimum safety factor of 2 and arranged to provide all directional restraint. Seismic solid brace end connectors shall be steel assemblies that swivel to the final installation angle and utilize two through bolts to provide proper attachment. Seismic solid brace assembly shall have anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified load ratings. Solid seismic brace assemblies shall be type **SSB**, **SSBS** or **SSRF** as manufactured by Mason Industries, Inc.

Note: Specifications 12 - 14 apply to trapeze as well as clevis hanger locations. At trapeze anchor locations piping must be shackled to the trapeze. Specifications apply to hanging equipment as well.

14. Steel angles, sized to prevent buckling, shall be clamped to pipe or equipment rods utilizing a minimum of three ductile iron clamps at each restraint location when required. Welding of support rods is not acceptable. Rod clamp assemblies shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Rod clamp assemblies shall be type **SRC** or **UC** as manufactured by Mason Industries, Inc.

15. Pipe clevis cross bolt braces are required in all restraint locations. They shall be special

purpose preformed channels deep enough to be held in place by bolts passing over the cross bolt. Clevis cross braces shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California. Clevis cross brace shall be type **CCB** as manufactured by Mason Industries, Inc.

16. All-directional seismic snubbers shall consist of interlocking steel members restrained by a one-piece molded neoprene bushing of bridge bearing neoprene. Bushing shall be replaceable and a minimum of 1/4" thick. Rated loadings shall not exceed 1000 psi. A minimum air gap of 1/8" shall be incorporated in the snubber design in all directions before contact is made between the rigid and resilient surfaces. Snubber end caps shall be removable to allow inspection of internal clearances. Neoprene bushings shall be rotated to insure no short circuits exist before systems are activated. Snubbers shall have an Anchorage Preapproval OPA Number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Snubber shall be type **Z-1225** as manufactured by Mason Industries, Inc.

17. All directional seismic snubbers shall consist of interlocking steel members restrained by shock absorbent rubber materials compounded to bridge bearing specifications. Elastomeric materials shall be replaceable and a minimum of 3/4" thick. Rated loadings shall not exceed 1000 psi. Snubbers shall be manufactured with an air gap between hard and resilient material of not less than 1/8" nor more than 1/4". Snubbers shall be installed with factory set clearances. The capacity of the seismic snubber at 3/8" deflection shall be equal or greater than the load assigned to the mounting grouping controlled by the snubber multiplied by the applicable G force. Submittals shall include the load deflection curves up to 1/2" deflection in the x, y and z planes. Snubbers shall have an anchorage preapproval OPA number from OSHPD in the state of California verifying the maximum certified horizontal and vertical load ratings. Snubbers shall be type **Z-1011** as manufactured by Mason Industries, Inc.

18. Stud wedge anchors shall be manufactured from full diameter wire, not from undersized wire that is rolled up to create the thread. The stud anchor shall also have a safety shoulder which fully supports the wedge ring under load. The stud anchors shall have an evaluation report number from the I.C.B.O Evaluation Service, Inc. verifying its allowable loads. Drill-in stud wedge anchors shall be type **SAS** as manufactured by Mason Industries, Inc.

19. Female wedge anchors are preferred in floor locations so isolators or equipment can be slid into place after the anchors are installed. Anchors shall be manufactured from full diameter wire, and shall have a safety shoulder to fully support the wedge ring under load. Female wedge anchors shall have an evaluation report number from the I.C.B.O. Evaluation Service, Inc. verifying to its allowable loads. Drill-in female wedge anchors shall be type **SAB** as manufactured by Mason Industries, Inc.

20. Vibration isolation manufacturer shall furnish integral structural steel bases. Rectangular bases are preferred for all equipment. Centrifugal refrigeration machines and pump bases may be T or L shaped where space is a problem. Pump bases for split case pump shall include supports for suction and discharge elbows. All perimeter members shall be steel beams with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14"

provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1". Bases shall be type **WF** as manufactured by Mason Industries, Inc.

21. Vibration isolation manufacturer shall furnish rectangular steel concrete pouring forms for floating and inertia foundations. Bases for split case pumps shall be large enough to provide for suction and discharge elbows. Bases shall be a minimum of 1/12 of the longest dimension of the base but not less than 6". The base depth need not exceed 12" unless specifically recommended by the base manufacturer for mass or rigidity. Forms shall include minimum concrete reinforcing consisting of 1/2" bars welded in place on 6" centers running both ways in a layer 1" above the bottom. Forms shall be furnished with steel templates to hold the anchor bolts sleeves and anchors while concrete is being poured. Height saving brackets shall be employed in all mounting locations to maintain a 1" clearance below the base. Wooden formed bases leaving a concrete rather than a steel finish are not acceptable. Base shall be type **BMK** or **K** as manufactured by Mason Industries, Inc.

22. Curb mounted rooftop equipment shall be mounted on spring isolation curbs. The lower member shall consist of a sheet metal or structural steel sections containing adjustable and removable steel springs that support the upper floating section. The upper frame must provide continuous support for the equipment and must be captive so as to resiliently resist wind and seismic forces. All directional neoprene snubber bushings shall be a minimum of 1/4" thick. Steel springs shall be laterally stable and rest on 1/4" thick neoprene acoustical pads. Hardware must be plated and the springs provided with a rust resistant finish. The curbs waterproofing shall consist of a continuous flexible flashing nailed over the lower curbs waterproofing. All spring locations shall have accessibility to adjust springs. Lower curbs shall have provision for 2" of insulation. The roof curbs shall be built to seismically contain the rooftop unit. The unit must be solidly fastened to the top floating rail, and the lower section anchored to the roof structure. Curb shall have anchorage pre-approval OPA from OSHPD in the state of California attesting to the maximum certified horizontal and vertical load ratings. Curb shall be type **SRSC** or **RMSS** as manufactured by Mason Industries, Inc.

23. Flexible spherical expansion joints shall employ peroxide cured EPDM in the covers, liners and Kevlar tire cord frictioning. Any substitutions must have equal or superior physical and chemical characteristics. Solid steel rings shall be used within the raised face rubber flanged ends to prevent pullout. Flexible cable bead wire is not acceptable. Sizes 2" and larger shall have two spheres reinforced with a ductile iron external ring between spheres. Flanges shall be split ductile iron or steel with hooked or similar interlocks. Sizes 16" to 24" may be single sphere. Sizes 6" to 16" may have threaded two piece bolted flange assemblies, one sphere and cable retention. Connectors shall be rated at 250 psi up to 170EF (77EC) with a uniform drop in allowable pressure to 215 psi (1.48MPa) at 250EF (121EC) in sizes through 14" (350mm). 16" (400mm) through 24" (600mm) single sphere minimum ratings are 180 psi (1.24MPa) at 170EF (77EC) and 150 psi (1.03MPa) at 250EF (121EC). Higher rated connectors may be used to accommodate service conditions. All expansion joints must be factory tested to 150% of rated pressure for 12 minutes before shipment. Safety factors to burst and flange pullout shall be a minimum of 3/1. Concentric reducers to the above ratings may be substituted for equal ended expansion joints.

Expansion joints shall be installed in piping gaps equal to the length of the expansion joints under pressure. Control rods need only be used in unanchored piping locations where the manufacturer determines the installation exceeds the pressure requirement without control rods. If control rods are used, they must have $\frac{1}{8}$ " (12mm) thick Neoprene washer bushings large enough in diameter to take the thrust at 1000 psi (.7 kg/mm²) maximum on the washer area.

Submittals shall include two test reports by independent consultants showing minimum reductions of 20 DB in vibration accelerations and 10 DB in sound pressure levels at typical blade passage frequencies on this or a similar product by the same manufacturer. All expansion joints shall be installed on the equipment side of the shut off valves. Expansion joints shall be type **SAFEFLEX SFDEJ, SFEJ, SFDJR or SFU** and Control Rods **CR** as manufactured by Mason Industries, Inc.

24. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3" and larger shall be flanged. Smaller sizes shall have male nipples. Minimum lengths shall be as tabulated:

25. All-directional acoustical pipe anchor, consisting of two sizes of steel tubing separated by a minimum 1/2" thick 60 durometer neoprene. Vertical restraint shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material should not exceed 500 psi and the design shall be balanced for equal resistance in any direction. All-directional anchors shall be type **ADA** as manufactured by Mason Industries, Inc.

26. Pipe guides shall consist of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1/2" thickness of 60 durometer neoprene. The height of the guides shall be preset with a shear pin to allow vertical motion due to pipe expansion or contraction. Shear pin shall be removable and reinsertable to allow for selection of pipe movement. Guides shall be capable of ∇ 1 5/8" motion, or to meet location requirements. Pipe guides shall be type **VSG** as manufactured by Mason Industries, Inc.

27. Split Wall Seals consist of two bolted pipe halves with minimum 3/4" thick neoprene sponge bonded to the inner faces. The seal shall be tightened around the pipe to eliminate clearance between the inner sponge face and the piping. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not already in place around the pipe prior to the construction of the building member. Seals shall project a minimum of 1" past either face of the wall. Where temperatures exceed 240EF(115EC), 10# density fiberglass may be used in lieu of the sponge. Seals shall be type **SWS** as manufactured by Mason Industries, Inc.

28. The horizontal thrust restraint shall consist of a spring element in series with a neoprene molded cup as described in specification 5 with the same deflection as specified for the mountings or hangers. The spring element shall be designed so it can be preset for thrust at the factory and adjusted in the field to allow for a maximum of 1/4" movement at start and stop. The assembly shall be furnished with 1 rod and angle brackets for attachment to both the equipment and the ductwork or the equipment and the structure. Horizontal restraints shall be attached at the centerline of thrust and symmetrical on either side of the unit. Horizontal thrust restraints shall be

type **WBI/WBD** as manufactured by Mason Industries, Inc.

29. Housekeeping pad anchors shall consist of a ductile iron casting that is tapered and hexagonal, smaller at its base than at its top. The upper portion shall have holes for rebar to pass through. The anchor shall be continuously threaded from top to bottom for the attachment of soleplates. Housekeeping pad anchors shall be attached to the structural slab using a stud wedge anchor. Housekeeping pad anchors shall be type **HPA** and stud wedge anchor shall be type **SAS** both as manufactured by Mason Industries, Inc.

PART 3 - EXECUTION

3.01 General

All vibration isolators and seismic restraint systems must be installed in strict accordance with the manufacturers written instructions and all certified submittal data.

Installation of vibration isolators and seismic restraints must not cause any change of position of equipment, piping or ductwork resulting in stresses or misalignment.

No rigid connections between equipment and the building structure shall be made that degrades the noise and vibration control system herein specified.

The contractor shall not install any equipment, piping or duct which makes rigid connections with the building unless isolation is not specified. "Building" includes, but is not limited to, slabs, beams, columns, studs and walls.

Coordinate work with other trades to avoid rigid contact with the building.

Any conflicts with other trades which will result in rigid contact with equipment or piping due to inadequate space or other unforeseen conditions should be brought to the architects/engineers attention prior to installation. Corrective work necessitated by conflicts after installation shall be at the responsible contractors expense.

Bring to the architects/engineers attention any discrepancies between the specifications and the field conditions or changes required due to specific equipment selection, prior to installation. Corrective work necessitated by discrepancies after installation shall be at the responsible contractors expense.

Correct, at no additional cost, all installations which are deemed defective in workmanship and materials at the contractors expense.

Overstressing of the building structure must not occur because of overhead support of equipment. Contractor must submit loads to the structural engineer of record for approval. Generally bracing may occur from:

Flanges of structural beams.

Cast in place inserts or wedge type drill-in concrete anchors.

Specification 12 cable restraints shall be installed slightly slack to avoid short circuiting the isolated suspended equipment, piping or conduit.

Specification 12 cable assemblies are installed taut on non-isolated systems. Specification 13 seismic solid braces may be used in place of cables on rigidly attached systems only.

At locations where specification 12 or 13 restraints are located, the support rods must be braced when necessary to accept compressive loads with specification 14 braces.

At locations where specification 12 cable restraints are installed on support rods with spring isolators, the spring isolation hangers must be specification type 10A.

At all locations where specification 12 or 13 restraints are attached to pipe clevis, the clevis cross bolt must be reinforced with specification type 15 braces.

Drill-in concrete anchors for ceiling and wall installation shall be specification type 18, and specification type 19 female wedge type for floor mounted equipment.

Vibration isolation manufacturer shall furnish integral structural steel bases as required. Independent steel rails are not permitted on this project.

Where piping passes through walls, floors or ceilings the vibration isolation manufacturer shall provide specification 27 wall seals.

Air handling equipment and centrifugal fans shall be protected against excessive displacement which results from high air thrust in relation to the equipment weight. Horizontal thrust restraint shall be specification type 28 (see selection guide).

Locate isolation hangers as near to the overhead support structure as possible.

All mechanical equipment shall be vibration isolated and seismically restrained as per the schedules in part 4 of this specification.

3.02 Vibration Isolation of Piping

Horizontal pipe isolation: The first four pipe hangers in the main lines near the mechanical equipment shall be as described in specification 11. Brace hanger rods with SRC clamps specification 14. Horizontal runs in all other locations throughout the building shall be isolated by hangers as described in specification 10 & 10A. Floor supported piping shall rest on isolators as described in specification 6. The first three isolators from the isolated equipment will have the

same static deflection as specified for the mountings under the connected equipment. If piping is connected to equipment located in basements and hangs from ceilings under occupied spaces the first three hangers shall have 0.75" deflection for pipe sizes up to and including 3", 1 1/2" deflection for pipe sizes up to and including 6" and 2 1/2" deflection thereafter. Hangers shall be located as close to the overhead structure as practical. Hanger locations that also have seismic restraints attached must have type RW Rebound Washers to limit uplift. Where piping connects to mechanical equipment install specification 23 expansion joints or specification 24 stainless hoses if 23 is not suitable for the service.

Riser isolation: Risers shall be suspended from specification 10A hangers or supported by specification 5 mountings, anchored with specification 25 anchors, and guided with specification 26 sliding guides. Steel springs shall be a minimum of 0.75" except in those expansion locations where additional deflection is required to limit load changes to ∇ 25% of the initial load. Submittals must include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on the building structure, spring deflection changes and seismic loads. Submittal data shall include certification that the riser system has been examined for excessive stresses and that none will exist in the proposed design.

3.03 Seismic Restraint of Piping

Seismically restrain all piping listed below. Use specification 12 cables if isolated. Specification 12 or 13 restraints may be used on un-isolated piping.

Piping located in mechanical equipment rooms and refrigeration equipment rooms that is 1 1/4" I.D. and larger.

All other piping 2 1/2" diameter and larger.

Transverse piping restraints shall be at 40' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

Longitudinal restraints shall be at 80' maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.

Transverse restraint for one pipe section may also act as a longitudinal restraint for a pipe section of the same size connected perpendicular to it if the restraint is installed within 24" of the elbow or TEE or combined stresses are within allowable limits at longer distances.

Hold down clamps must be used to attach pipe to all trapeze members before applying restraints in a manner similar to clevis supports.

Branch lines may not be used to restrain main lines.

Connection to the structure must be made with a non-friction connection (i.e. no "C" clamps)

Hanger locations that also have seismic restraints attached must have Specification 10A type RW Rebound Washers.

3.04 Pipe Exclusions

Piping in mechanical rooms less than 1 1/4" inside diameter.

All other piping less than 2 1/2" inside diameter.

All piping suspended by clevis hangers where the distance from the top of the pipe to the suspension point is 12" or less.

All trapezed piping where the distance from the suspension point to the trapeze member is 12" or less.

If any suspension location in the run exceeds the above, the entire run must be braced.

3.05 Vibration Isolation and Seismic Restraint of Ductwork

Vibration isolation of ductwork

All discharge runs for a distance of 50' from the connected equipment shall be isolated from the building structure by means of specification 10 hangers or specification 5 floor isolators. Spring deflection shall be a minimum of 0.75".

All duct runs having air velocity of 1000 fpm or more shall be isolated from the building structure by specification 11 hangers or 5 floor supports. Spring deflection shall be a minimum of 0.75".

Seismic restraint of ductwork

Seismically restrain all ductwork with specification 12 or 13 restraints as listed below:

Restrain rectangular ducts with cross sectional area of 6 sq.ft. or larger.

Restrain round ducts with diameters of 28" or larger.

Transverse restraints shall occur at 30' intervals or at both ends of the duct run if less than the specified interval. Transverse restraints shall be installed at each duct turn and at each end of a duct run.

Longitudinal restraints shall occur at 60' intervals with at least one restraint per duct run. Transverse restraints for one duct section may also act as a longitudinal restraint for a duct section connected perpendicular to it if the restraints are installed within 4' of the intersection of the ducts and if the restraints are sized for the larger duct. Duct joints shall conform to SMACNA duct construction standards.

The ductwork must be reinforced at the restraint locations. Reinforcement shall consist of an additional angle on top of the ductwork that is attached to the support hanger rods. Ductwork is to be attached to both upper angle and lower trapeze.

A group of ducts may be combined in a larger frame so that the combined weights and dimensions of the ducts are less than or equal to the maximum weight and dimensions of the duct for which bracing details are selected.

Walls, including gypsum board non bearing partitions, which have ducts running through them may replace a typical transverse brace. Provide channel framing around ducts and solid blocking between the duct and frame.

Connection to the structure must be made with a non-friction connection (i.e. no "C" clamps)

Hanger locations that also have seismic restraints attached must have Specification 10A type RW Rebound Washers.

3.06 Ductwork Exclusions

Rectangular and square and ducts that are less than 6 square feet in cross sectional area.

Round duct less than 28" in diameter.

All trapezed ductwork where the distance from the suspension point to the trapeze member is 12" or less.

Ductwork hung with straps where the top of the duct is 12" or less from the suspension point and the strap has 2 #10 sheet metal screws within 2" of the top of the duct.

If any suspension location in the run exceeds the above, the entire run must be braced.

END OF SECTION 230548

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SECTION 230553

MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.02 DESCRIPTION OF WORK:

Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-15 sections.

Types of identification devices specified in this section include the following:

- Painted Identification Materials.
- Plastic Pipe Markers.
- Plastic Tape.
- Plastic Duct Markers.
- Engraved Plastic-Laminate Signs.
- Plastic Equipment Markers.
- Plasticized Tags.

1.03 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards:

ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.04 SUBMITTALS:

Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required.

Samples: Submit samples of each color, lettering style and other graphic representation required for each identification material or system.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering mechanical identification materials which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide mechanical identification materials of one of the following:

Allen Systems, Inc.
Brady (W.H.) Co.; Signmark Div.
Industrial Safety Supply Co., Inc.
Seton Name Plate Corp.

2.02 MECHANICAL IDENTIFICATION MATERIALS:

General: Provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for application, selection shall be approved by the FDNY prior to installation, provide single selection for each product category.

2.03 PAINTED IDENTIFICATION MATERIALS:

Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.

Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.

Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ANSI A13.1 for colors.

2.04 PLASTIC PIPE MARKERS:

Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid snap-on, color-coded pipe markers, complying with ANSI A13.1

Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive,

color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1

Insulation: Furnish 1" thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed on uninsulated pipes subjected to fluid temperatures of 125 degrees F or greater. Cut length to extend 2" beyond each end of plastic pipe marker.

Small Pipes: For external diameters less than 6" (including insulation if any), provide full-band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:

Snap-on application of pre-tensioned semi-rigid plastic pipe marker.

Adhesive lap joint in pipe marker overlap.

Laminated or bonded application of pipe marker to pipe (or insulation).

Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 3/4" wide; full circle at both ends of pipe marker, tape lapped 1-1/2".

2.05 PLASTIC DUCT MARKERS:

General: Provide manufacturer's standard laminated plastic, color coded duct markers. Conform to the following color code:

Green: Cold air.

Yellow: Hot air.

Yellow/Green: Supply air.

Blue: Exhaust, outside, return, and mixed air.

For hazardous exhausts, use colors and designs recommended by ANSI A13.1.

Nomenclature: Include the following:

Direction of air flow.

Duct service (supply, return, exhaust, etc.).

Duct origin (from).

Duct destination (to).

Design cfm.

Access Panel Markers: Provide manufacturer's standard 1/16" thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve. Include 1/8" center hole to allow attachment.

2.06 PLASTIC EQUIPMENT MARKERS:

General: Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code:

Green: Cooling equipment and components.

Yellow: Heating equipment and components.

Yellow/Green: Combination cooling and heating equipment and components.

Blue: Equipment and components that do not meet any of the above criteria.

For hazardous equipment, use colors and designs recommended by ANSI A13.1.

Nomenclature: Include the following, matching terminology on schedules as closely as possible:

Name and plan number.

Equipment service.

Design capacity.

Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.

Size: Provide approximate 2-1/2" x 4" markers for control devices, dampers, and valves; and 4-1/2" x 6" for equipment.

2.07 LETTERING AND GRAPHICS:

General: Coordinate names, abbreviations and other designations used in mechanical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.

Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (as examples; Boiler No. 3, Air Supply No. 1H, Standpipe F12).

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS:

Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.02 DUCTWORK IDENTIFICATION:

General: Identify air supply, return, exhaust, intake and relief ductwork with duct markers; or provide stenciled signs and arrows, showing ductwork service and direction of flow, in black or white

(whichever provides most contrast with ductwork color).

Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures (shaft, underground or similar concealment), and at 50' spacings along exposed runs.

Access Doors: Provide duct markers or stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions, and appropriate safety and procedural information.

Concealed Doors: Where access doors are concealed above acoustical ceilings or similar concealment, plasticized tags may be installed for identification in lieu of specified signs, at Installer's option.

3.03 PIPING SYSTEM IDENTIFICATION:

General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:

Plastic pipe markers, with application system as indicated under "Materials" in this section. Install on pipe insulation segment where required for hot non-insulated pipes.

Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.

Near locations where pipes pass through walls or floors/ ceilings, or enter non-accessible enclosures.

At access doors, manholes and similar access points which permit view of concealed piping.

Near major equipment items and other points of origination and termination.

Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

On piping above removable acoustical ceilings.

3.04 MECHANICAL EQUIPMENT IDENTIFICATION:

General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device. Provide signs for the following general categories of equipment and operational devices:

Main control and operating valves, including safety devices and hazardous units such as gas outlets.

Meters, gages, thermometers and similar units.

Fuel-burning units including unit furnaces, heaters.

Pumps, compressors, chillers, condensers and similar motor- driven units.

Fans, blowers, primary balancing dampers and mixing boxes.

Packaged HVAC units.

Optional Sign Types: Where lettering larger than 1" height is needed for proper identification, because of distance from normal location of required identification, stenciled signs may be provided in lieu of engraved plastic, at Installer's option.

Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proportionately larger lettering for greater distances. Provide secondary lettering of 2/3 to 3/4 of size of the principal lettering.

Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.05 ADJUSTING AND CLEANING:

Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

Cleaning: Clean face of identification devices, and glass frames of valve charts.

3.06 EXTRA STOCK:

Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

Where stenciled markers are provided, clean and retain stencils after completion of stenciling and include used stencils in extra stock, along with required stock of stenciling paints and applicators.

END OF SECTION 230553

SECTION 230593

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

Related Sections:

Other Sections specify balancing devices and their installation, and materials and installations of mechanical systems.

Individual system sections specify leak testing requirements and procedures.

1.02 SUMMARY:

This Section specifies the requirements and procedures total mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

Test, adjust, and balance the following mechanical systems:

Supply air systems

Return air systems;

Exhaust air systems;

Verify temperature control system operation.

Test: To determine quantitative performance of equipment.

Adjust: To regulate the specified flow rate and air patterns at the terminal equipment

Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.

Procedure: Standardized approach and execution of sequence of work operations to yield

reproducible results.

Report forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.

Terminal: The point where the controlled fluid enters or leaves the distribution system. These are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return inlets on air terminals such as registers, grilles, diffusers, louvers, and hoods.

Main: Duct or pipe containing the system's major or entire fluid flow.

Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.

Branch main: Duct or pipe serving two or more terminals.

Branch: Duct or pipe serving a single terminal.

1.03 SUBMITTALS:

Agency Data:

Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below.

Engineer and Technicians Data:

Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures meet the qualifications specified below.

Procedures and Agenda: Submit a synopsis of the testing, adjusting, and balancing procedures and agenda proposed to be used for this project.

Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 1 and Section 15010.

Sample Forms: Submit sample forms, if other than those standard forms prepared by the AABC are proposed.

Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an

accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below:

Draft reports: Upon completion of testing, adjusting, and balancing procedures, prepare draft reports on the approved forms. Draft reports may be hand written, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports. Submit 2 complete sets of draft reports. Only 1 complete set of draft reports will be returned.

Final Report: Upon verification and approval of draft reports, prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final reports.

Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:

- General Information and Summary
- Air Systems
- Temperature Control Systems

Report Contents: Provide the following minimum information, forms and data:

General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.

The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC, for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.

Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.04 QUALITY ASSURANCE:

Test and Balance Engineer's Qualifications: A Professional Engineer (either on the installer's staff or and independent consultant), registered in the State in which the services are to be performed, and having at least 5-years of successful testing, adjusting, and balancing experience on projects with testing and balancing requirements similar to those required for this project.

Agency Qualifications:

Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

An independent testing, adjusting, and balancing agency certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project, and having at least one Professional Engineer registered in the State in which the services are to be performed, certified by AABC as a Test and Balance Engineer.

Codes and Standards:

AABC: "National Standards For Total System Balance".

ASHRAE: ASHRAE Handbook, 1984 Systems Volume, Chapter 37, Testing, Adjusting, and Balancing.

Pre-Balancing Conference: Prior to beginning of the testing, adjusting, and balancing procedures, schedule and conduct a conference with the Architect/Engineer and representatives of installers of the mechanical systems. The objective of the conference is final coordination and verification of system operation and readiness for testing, adjusting, and balancing.

1.05 PROJECT CONDITIONS:

Systems Operation: Systems shall be fully operational prior to beginning procedures.

1.06 SEQUENCING AND SCHEDULING:

Test, adjust, and balance the air systems before hydronic, steam, and refrigerant systems.

Test, adjust and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg.F wet bulb temperature of maximum summer design condition, and within 10 deg.F dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 PRELIMINARY PROCEDURES FOR AIR SYSTEM BALANCING:

Before operating the system, perform these steps:

Obtain design drawings and specifications and become thoroughly acquainted with the design intent.

Obtain copies of approved shop drawings of all air handling equipment, outlets (supply, return, and exhaust) and temperature control diagrams.

Compare design to installed equipment and field installations.

Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.

Check filters for cleanliness.

Check dampers (both volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans.

Prepare report test sheets for both fans and outlets. Obtain manufacturer's outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a crosscheck with required fan volumes.

Determine best locations in main and branch ductwork for most accurate duct traverses.

Place outlet dampers in the full open position.

Prepare schematic diagrams of system "as-built" ductwork and piping layouts to facilitate reporting.

Lubricate all motors and bearings.

Check fan belt tension.

Check fan rotation.

3.02 MEASUREMENTS:

Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.

Provide instruments meeting the specifications of the referenced standards.

Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.

Apply instrument as recommended by the manufacturer.

Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.

When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.

Take all reading with the eye at the level of the indicated value to prevent parallax.

Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.

Take measurements in the system where best suited to the task.

3.03 PERFORMING TESTING, ADJUSTING, AND BALANCING:

Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.

Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.

Patch insulation, ductwork, and housings, using materials identical to those removed.

Seal ducts and piping, and test for and repair leaks.

Seal insulation to re-establish integrity of the vapor barrier.

Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test

results.

3.04 RECORD AND REPORT DATA:

Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms.

Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

3.05 DEMONSTRATION:

Schedule training with Owner through the Architect/Engineer with at least 7 days prior notice.

END OF SECTION 230593

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SECTION 230007

MECHANICAL INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data and installation instructions for each type of HVAC insulation. Submit schedule showing manufacturer's product number, k-value, thickness, and furnished accessories for each HVAC system requiring insulation.

1.03 DESCRIPTION OF WORK:

Extent of HVAC insulation required by this section is indicated on drawings and schedules, and by requirements of this section.

Types of HVAC insulation specified in this section include the following:

Piping Systems Insulation:

Fiberglass.

Flexible Unicellular.

Ductwork System Insulation:

Fiberglass.

1.04 QUALITY ASSURANCE:

Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

Flame/Smoke Ratings: Provide composite HVAC insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.05 DELIVERY, STORAGE, AND HANDLING:

Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard indexes of products.

Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Certainteed Corp.
Knauf Fiber Glass GmbH.
Manville Products Corp.
Owens-Corning Fiberglas Corp.
Or approved equal.

2.02 PIPING INSULATION MATERIALS:

Fiberglass Piping Insulation: ASTM C 547, Class 1 unless otherwise indicated.

Flexible Unicellular Piping Insulation: ASTM C 534, Type I.

Jackets for Piping Insulation: ASTM C 921, Type I for piping with temperatures below ambient, Type II for piping with temperatures above ambient. Type I may be used for all piping at Installers option.

Encase pipe fittings insulation with one-piece premolded fitting covers, fastened as per manufacturer's recommendations.

Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

2.03 DUCTWORK INSULATION MATERIALS:

Rigid Fiberglass Ductwork Insulation: ASTM C 612, Class 1.

Flexible Fiberglass Ductwork Insulation: ASTM C 553, Type I, Class B-4.

Jackets for Ductwork Insulation: ASTM C 921, Type I all for ductwork.

Ductwork Insulation Accessories: Provide bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.

Ductwork Insulation Compounds: Provide cements, adhesives, coatings, sealers, protective finishes and similar compounds as recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine areas and conditions under which HVAC insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 HVAC PIPING SYSTEM INSULATION:

Insulation Omitted: Omit insulation on hot piping within radiation enclosures or unit cabinets; on condensate piping between steam trap and union; and on unions, flanges, strainers, flexible connections, and expansion joints.

Cold Piping:

Application Requirements: Insulate the following cold HVAC piping systems:

- Air conditioner condensate drain piping.
- Refrigerant Piping

Insulate each piping system specified above with one of the following types and thicknesses of insulation:

Condensate Drain Piping: Fiberglass: 1" thick for pipe sizes up to & including 4".

Refrigerant Pipe: Flexible Unicellular: 1/2" thick for pipe sizes up to 1-1/2".

3.03 DUCTWORK SYSTEM INSULATION:

Indoor Air Conditioning Ductwork

All supply and return ductwork shall be externally insulated with 1 in thick flexible fiberglass blanket with minimum 4 pound density and factory applied jacket.

Acoustical Lining

All supply and return ductwork shall be acoustically lined with 1" duct liner for a distance of twenty feet from fan. Acoustical lining shall be Owens Corning fiberglass "Aeroflex Plus" or approved equal.

Do not omit external insulation where liner is installed.

Outdoor Ductwork:

Application Requirements: Insulate the following ductwork:

Outdoor ductwork between air conditioning unit and roof.

2" in thick rigid board fiberglass duct insulation minimum 3 pound density. Insulation shall be covered with vapor barrier and weather and water resistant seal. Sealing material to be Venture Clad model 1577CW or approved equal.

3.04 INSTALLATION OF PIPING INSULATION:

General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

Install insulation on pipe systems subsequent to installation of heat tracing, painting, testing, and acceptance of tests.

Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with a single cut piece to complete run. Do not use cut pieces or scraps abutting each other.

Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure a complete and tight fit over surfaces to be covered.

Maintain integrity of vapor-barrier jackets on pipe insulation, and protect to prevent puncture or other damage.

Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded or precut units.

Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.

Butt pipe insulation against pipe hanger insulation inserts. For cold piping apply wet coat of vapor barrier lap cement on butt joints and seal joints with 3" wide vapor barrier tape or band.

3.05 INSTALLATION OF DUCTWORK INSULATION:

General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its indented purpose.

Install insulation materials with smooth and even surfaces.

Clean and dry ductwork prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

Maintain integrity of vapor-barrier on ductwork insulation, and protect it to prevent puncture and other damage,

Extent ductwork insulation without interruption through walls, floors and similar ductwork penetrations, except where otherwise indicated.

3.06 PROTECTION AND REPLACEMENT:

Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

Protection: Insulation Installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

END OF SECTION 230700

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SECTION 230933

ELECTRIC CONTROL SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data for each control device furnished, indicating dimensions, capacities, performance characteristics, electrical characteristics, finishes of materials, and including installation instructions and start-up instructions.

Shop Drawings: Refer to Section "Sequence of Operation" for shop drawings; not work of this section.

Shop Drawings: Submit shop drawings for each electric control system, containing the following information:

Schematic flow diagram of system showing fans, pumps, coils, dampers, valves, and control devices.

Label each control device with setting or adjustable range of control.

Indicate all required electrical wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.

Provide details of faces of control panels, including controls, instruments, and labeling.

Include verbal description of sequence of operation.

Maintenance Data: Submit maintenance instructions and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals; in accordance with requirements of Division 1.

1.03 DESCRIPTION OF WORK:

Extent of electric control systems work required by this section is indicated on drawings and schedules, and by requirements of this section.

Control sequences are specified in Section "Sequence of Operation".

Control sequences are specified in this section.

Interlock wiring between electrically-operated equipment units; and between equipment and field-installed control devices.

Interlock wiring specified as factory-installed is work of this section.

Provide the following electrical work as work of this section, complying with requirements of Division-16 sections:

Control wiring between field-installed controls, indicating devices, and unit control panels.

1.04 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of electric control equipment, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firms specializing and experienced in electric control system installations for not less than 5 years.

Codes and Standards:

Electrical Standards: Provide electrical products which have been tested, listed and labeled by UL and comply with NEMA standards.

NEMA Compliance: Comply with NEMA standards pertaining to components and devices for electric control systems.

NFPA Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems" where applicable to controls and control sequences and NFPA 70 "National Electric Code" for all wiring materials and methods.

1.05 DELIVERY, STORAGE, AND HANDLING:

Provide factory shipping cartons for each piece of equipment, and control device. Maintain cartons through shipping, storage and handling as required to prevent equipment damage, and to eliminate dirt and moisture from equipment. Store equipment and materials inside and protected from weather.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering electric control systems which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide electric control systems of one of the following:

Barber-Colman Co.; Energy Management Div.
Honeywell, Inc.
Johnson Controls, Inc.
Or approved equal.

2.02 MATERIALS AND EQUIPMENT:

General: Provide electric control products in sizes and capacities indicated, consisting of valves, dampers, thermostats, clocks, sensors, controllers, and other components as required for a complete installation. Except as otherwise indicated, provide manufacturer's standard control system components as indicated by published product information, designed and constructed as recommended by manufacturer. Provide electric control systems with following functional and construction features as indicated.

Dampers: Provide automatic control dampers as indicated, with damper frames not less than formed 13-ga galvanized steel. Provide mounting holes for enclosed duct mounting. Provide damper blades not less than formed 16-ga galvanized steel, with maximum blade width of 8". Equip dampers with motors, with proper rating for each application.

Secure blades to 1/2" diameter zinc-plated axles using zinc-plated hardware. Seal off against spring stainless steel blade bearings. Provide blade bearings of nylon and provide thrust bearings at each end of every blade. Construct blade linkage hardware of zinc-plated steel and brass. Submit leakage and flow characteristics, plus size schedule for controlled dampers.

Operating Temperature Range: From -20 degrees to 200 degrees F

Dampers shall be of the low-leakage type with opposed blade design with replaceable rubber seals, rated for leakage at less than 10 cfm sq. ft. of damper area, at differential pressure of 4" w.g. when damper is being held by torque of 50 inch-pounds.

Damper and Valve Motors: Size each motor to operate dampers or valves with sufficient reserve power to provide smooth modulating action or 2-position action as specified.

Provide permanent split-capacitor or shaded pole type motors with gear trains completely oil-immersed and sealed. Equip spring-return motors, where indicated on drawings or in operational sequence, with

integral spiral-spring mechanism. Furnish entire spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.

Equip motors for outdoor locations and for outside air intakes with "O ring" gaskets designed to make motors completely weatherproof, and equip with internal heaters to permit normal operation at -40 degrees F (-40 degrees C).

Furnish non-spring return motors for dampers larger than 25 sq. ft., and for valves larger than 2-1/2", sized for running torque rating of 150 inch-pounds, and breakaway torque rating of 300 inch-pounds. Size spring-return motors for running torque rating of 150 inch-pounds, and breakaway torque rating of 150 inch-pounds.

Room Thermostats:

Provide thermostats with digital readout. Each thermostat shall be provided with a locking cover.

Provide three sets of keys for thermostat covers. All cover locks shall have matched key sets. red-reading glass or spiral bi-metallic thermometers. Covers shall be heavy-duty "asylum type", clear plastic.

Line-Voltage On-Off Thermostats: Provide thermostats of bi-metal actuated open contact, or bellows actuated enclosed snap-switch type, or equivalent solid-state type; UL-listed at electrical rating comparable with application. Provide bimetal thermostats which employ heat anticipation. Equip thermostats which control electric heating loads directly, with Off position on dial wired to break ungrounded conductors.

Combination Thermostat and Fan Switches: Comply with requirements for line-voltage thermostats. In addition, include as integral part of each thermostat, 2-, 3-, or 4-position push-button or lever operated manual switch for control of fan in each unit with type of control as indicated.

Label switches "fan on-off", "fan high-low-off", "fan high- med-low-off". Provide factory-fabricated unit, capable of being mounted on 2-gang switch box or mud ring.

Low Voltage On-Off Thermostats: Comply with general requirement indicated for line-voltage thermostats. Provide thermostats of bimetal operated mercury-switch type, with either adjustable or fixed universal anticipation heater.

Low-Voltage Modulating Thermostats: Provide potentiometer type, operated by vapor-filled bellows.

Ionization Smoke Detectors: For each air handling unit and air system with capacity of 2,000 cfm or greater, provide UL-listed ionization smoke detectors in main supply air duct, and where indicated. Connect detectors into control circuits to stop fans in event of presence of smoke. Activation of smoke detectors shall annunciate to panel located Station Captain's Office on the first floor. Annuciation shall be both visual and audible. In addition, local wall mounted alarms shall be provided in the area served as indicated on the floor plans. Audible alarms shall be silenced at the local wall mounted stations.

Provide a smoke purge panel for the building. Smoke purge shall activate air conditioning unit exhaust fans and first floor south east entry exhaust fan. Each fan shall be activated individually. Smoke purge panel shall be located per NYC Building code requirements and FDNY standards. Panel location shall be coordinated with the FDNY prior to installation.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine areas and conditions under which electric control systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION OF ELECTRIC CONTROL SYSTEMS:

General: Install systems and materials in accordance with manufacturer's instructions and roughing-in drawings, and details on drawings. Install electrical components and use electrical products complying with requirements of applicable Division-16 sections of these specifications. Mount controllers at convenient locations and heights.

Control Wiring: The term "control wiring" is defined to include providing of wire, conduit and miscellaneous materials as required for mounting and connecting electric control devices.

Wiring System: Install complete control wiring system for electric control systems. Conceal wiring except in mechanical rooms and areas where other conduit and piping are exposed. Provide multi-conductor instrument harness (bundle) in place of single conductors where number of conductors can be run along common path. Fasten flexible conductors bridging cabinets and doors, neatly along hinge side, and protect against abrasion. Tie and support conductors neatly.

Number-code or color-code conductors, excluding those used for local individual room controls, appropriately for future identification and servicing of control system.

Unit-Mounted Equipment: Where control devices are indicated to be unit-mounted, ship electric relays, electric switches, valves, dampers, and damper motors to unit manufacturer for mounting and wiring at factory.

3.03 ADJUSTING AND CLEANING:

Start-Up: Start-up, test, and adjust electric control systems in presence of manufacturer's authorized representative. Demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

Final Adjustment: After completion of installation, adjust thermostats, control valves, motors and similar equipment provided as work of this section.

Final adjustment shall be performed by specially trained personnel in direct employ of manufacturer of primary temperature control system.

3.04 CLOSEOUT PROCEDURES:

Owner's Instructions: Provide services of manufacturer's technical representative for one 8-hour day to instruct Owner's personnel in operation and maintenance of electric control systems.

Schedule instruction with Owner, provide at least 7-day notice to Contractor and Engineer of training date.

END OF SECTION 230933

SECTION 230993

CONTROLS SEQUENCE OF OPERATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Shop Drawings: Submit shop drawings for each system automatically controlled, containing the following information:

Schematic flow diagram of system showing fans, pumps, coils, dampers, valves, and control devices.

Label each control device with setting or adjustable range of control.

Indicate electric wiring; factory and field wiring.

Indicate each control panel required, with internal and external wiring clearly indicated. Provide detail of panel face, including controls, instruments, and labeling. Include verbal description of sequence of operation.

1.03 DESCRIPTION OF WORK:

Sequence of operation is hereby defined as the manner and method by which controls function. Requirements for each type of control system operation are specified in this section.

Operating equipment, devices, and system components required for control systems are specified in Electric Controls' section of these specifications.

PART 2 - PRODUCTS (not applicable to this section).

PART 3 - EXECUTION

3.01 ROOFTOP AIR CONDITIONING UNITS

Unit shall be controlled by a wall mounted cooling/heating thermostat with sub base. Sub-base functions shall include timeclock for night setback, fan only and cooling and heating selection switch.

When sub-base is set to cooling position: On unit startup, outside air damper shall be indexed to the minimum open position. Unitary enthalpy controls shall determine when mechanical refrigeration is required. In economizer mode, unit compressors shall be deactivated. Outdoor air damper and internal exhaust fan shall be modulated based on enthalpy controller to provide up to 100 percent outdoor air for cooling. When economizer cycle determines that the use of outdoor air will not satisfy the space thermostat, unit shall index to mechanical cooling mode. In mechanical cooling mode, outdoor air damper shall be indexed to the minimum position. Compressors shall be activated. Compressors shall be modulated to maintain space thermostat setpoint.

When sub-base is set to heating: Gas fired heating section shall be activated and unit compressors shall be deactivated. On unit startup, system shall be placed in morning warm-up mode. In warm-up mode, outdoor air damper shall remain closed until space thermostat is satisfied. Heating section shall be modulated to high heat until space thermostat is satisfied. Once space thermostat is satisfied, outdoor air damper shall be indexed to the minimum open position and gas fired heating section shall be modulated to maintain space thermostat setpoint.

In fan only mode: outdoor air damper shall be closed and unit fan shall be activated.

When unit is deactivated: outdoor air damper shall be closed, unit compressors shall be deactivated, unit heating section shall be deactivated, unit fans shall be deactivated and controls shall be deactivated. .

3.02 APPARATUS FLOOR HEATING

Apparatus floor shall be heated by separated gas fired suspended unit heaters. Unit heaters shall be controlled by individual wall mounted two stage thermostats. Thermostats shall be furnished by the unit manufacturer. Unit gas valve shall be cycled to maintain setpoint of the thermostat.

3.03 APPARATUS FLOOR VENTILATION

Apparatus floor shall be ventilated by two wall mounted propeller type exhaust fans. Fans shall be controlled by a "Summer/Winter/Off" switch. In "Summer" position both wall mounted exhaust fans shall be activated. In "Winter" position only on fan shall be activated. In "Off" position both fans shall be deactivated. Activating fans in either summer or winter position shall open motorized damper at air intake louver above bay doors. Activating fan shall open corresponding motorized damper on fan discharge.

Activating "Nederemann" system shall index motorized damper at intake louver to minimum open position. Position shall be adjustable.

3.04 DUCTLESS SLIT SYSTEM AC EQUIPMENT

System shall be controlled by a manufacturers 7 day programmable controller. This controller shall be located in the Station Captain's Office. This controller shall control all functions of system including setback, timeclock, diagnostic and annunciation. Each unit shall be controlled by a dedicated wall

mounted controller. These controllers shall override programmable controller setpoints. This contractor to provide daisy chained twisted pair of wires run between all system components.

Units serving the southeast entry and BLS room: these units have dedicated outdoor intakes included in the systems. Intakes include motorized dampers. Dampers are to be interlocked with the units. Starting unit shall open outdoor air damper. Deactivating unit shall close outdoor air damper.

System shall be commissioned by factory trained manufacturer's personnel not installing contractor.

3.05 GAS METER AND ELECTRIC METER ROOM EXHAUST FANS

Gas meter room and Electric service room shall each be served by a dedicated exhaust. Each exhaust fan shall be operated 7 days per week, 24 hours per day and 365 days per year.

3.06 TOILET AND BATHROOM EXHAUST FANS

Exhaust fans shall be controlled by a seven day 24 hour digital programmable timeclock. Timeclock shall be located in the Station Captain's Office or other location selected by the FDNY. Location shall be verified with the FDNY prior to installation.

3.07 SMOKE PURGE

Smoke purge system shall be activated from the panel in the Station Captain's Office. Each individual zone shall be activated by a dedicated switch. Activating smoke purge shall activate exhaust fan in air conditioning unit or dedicated exhaust fan and shall open smoke dampers in ductwork.

END OF SECTION 230993

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SECTION 232300

MECHANICAL PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

Shop Drawings showing layout of refrigerant piping and condensate drain piping, specialties, and fittings including, but not necessarily limited to, pipe and tube sizes, valve arrangements and locations, slopes of horizontal runs, wall and floor penetrations, and equipment connection details. Show interface and spatial relationship between piping and proximate to equipment.

1.03 QUALITY ASSURANCE

Installation shall comply with the requirements of the NYC Building Code, Fire Department Regulations, NFPA and all codes and authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 PIPE AND TUBING MATERIALS

Refrigerant Piping - Copper Tubing: ASTM B 280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

Condensate Drain Piping - Copper Tubing: Type DWV, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

2.02 FITTINGS

Wrought-Copper Fittings: ANSI B16.22, streamlined pattern.

2.03 JOINING MATERIALS

Brazing Filler Metals: AWS A5.8, Classification BAg-1 (Silver).

2.04 REFRIGERANT

Refrigerant No. 410A, in accordance with ASHRAE Standard 34.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine rough-in for piping systems to verify actual locations of piping connections prior to installation.

3.02 PIPE APPLICATIONS

Refrigerant Piping

Use Type ACR drawn copper tubing with wrought copper fittings and brazed joints above ground, within building. Use Type K, annealed temper copper tubing for 2 inch and smaller without joints, on exterior of building. Mechanical fittings (crimp or flair) are not permitted.

Condensate Drain Piping

Install Copper DWV tubing with wrought copper fittings and solder joints for 3 inch and smaller, above ground, within building. PVC condensate drain piping will not be permitted in compliance with the NYC building Code and FDNY regulations.

3.03 DELIVERY, STORAGE AND HANDLING:

Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.

Protect stored pipes and tubes. Elevate above grade and enclose with durable, waterproof wrapping. When stored inside, do not exceed structural capacity of the floor.

Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or by packaging with durable waterproof wrapping.

3.04 PIPING INSTALLATIONS

Refrigerant Piping

General: Install refrigerant piping in accordance with ASHRAE Standard 15 - "The Safety Code for Mechanical Refrigeration."

Install piping in as short and direct arrangement as possible to minimize pressure drop.

Install piping for minimum number of joints using as few elbows and other fitting as possible.

Arrange piping to allow normal inspection and servicing of compressor and other equipment. Install valves and specialties in accessible locations to allow for servicing and inspection.

Provide adequate clearance between pipe and adjacent walls and hanger, or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full thickness insulation.

Insulate suction lines. Liquid lines are not required to be insulated.

Do not install insulation until system testing has been completed and all leaks have been eliminated.

Slope refrigerant piping as follows:

Install horizontal hot gas discharge piping with 1/2" per 10 feet downward slope away from the compressor.

Install horizontal suction lines with 1/2 inch per 10 feet downward slope to the compressor, with no long traps or dead ends which may cause oil to separate from the suction gas and return to the compressor in damaging slugs.

Install traps and double risers where indicated, and where required to entrain oil in vertical runs.

Liquid lines may be installed level.

Use manufacturer's REFNET fittings for all changes in direction and all branch connections.

Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Provide space to permit insulation applications, with 1 inch clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.

Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inch shall be steel; pipe sleeves 6 inch and larger shall be sheet metal.

Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, and floors,

maintain the fire rated integrity. Refer to Division 7 for special sealers and materials.

Make reductions in pipe sizes using eccentric reducer fittings installed with the level side down.

Condensate Drain Piping

Locations Arrangements: Drawings (plans, and details) indicate the general location arrangement of piping systems. Submit details and explanation of any proposed deviations for review prior to installations.

Use fittings for all changes in direction and all branch connections.

Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Provide space to permit insulation applications, with 1" minimum clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.

Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity. Provide fire barrier sealant around piping penetrations.

Install piping at a uniform pitch of 1/8" per foot downward in the direction of flow.

Make reductions in pipe sizes using eccentric reducer fitting installed with the level side up.

Install branch connections to mains using Tee-Wye fittings.

Install unions in pipes 2 inch and smaller at final connections to each piece of equipment, and elsewhere as indicated.

3.05 HANGERS AND SUPPORTS

General: Hanger, supports, and anchors devices are specified in Division 15 Section "HVAC SUPPORTS AND ANCHORS." Conform to the table below for maximum spacing of supports:

Install the following pipe attachments:

Adjustable steel clevis hangers for individual horizontal runs. Use copper hangers on copper pipe. less than 20 feet in length.

Install hangers with the following minimum rod sizes and maximum spacing:

Nom. Pipe Size	Max. Span-Ft.	Min. Rod Size-Inches
----------------	---------------	----------------------

1-1/2	7	3/8
1-1/2	9	3/8
2	10	3/8
3	12	1/2
4	14	5/8

Support vertical runs at each floor.

3.06 EQUIPMENT CONNECTIONS

The Drawings indicate the general arrangement of piping, fittings, and specialties.

Install piping adjacent to machine to allow servicing and maintenance.

3.07 FIELD QUALITY CONTROL

Inspect, test, and perform corrective action of refrigerant piping in accordance with Testing and Balancing Section of this specification.

Repair leaking joints using new materials, and retest for leaks.

3.08 CLEANING

Before installation of copper tubing other than Type ACR tubing, clean the tubing and fitting using following cleaning procedure:

Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through the tubing by means of a wire or an electrician's tape.

Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.

Finally, draw a clean, dry, lintless cloth through the tube or pipe.

3.09 ADJUSTING AND CLEANING

Verify actual evaporator applications and operating conditions, and adjust thermostatic expansion valve to obtain proper evaporator superheat requirements.

Clean and inspect refrigerant piping systems in accordance with requirements of Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

Adjust controls and safeties. Replace damaged or malfunctioning controls and equipment with new

materials and products.

3.10 COMMISSIONING

Charge system using the following procedure:

Install core in filter dryer after leak test but before evacuation.

Evacuate refrigerant system with vacuum pump; until temperature of 35 deg F is indicated on vacuum dehydration indicator.

During evacuation, apply heat to pockets, elbows, and low spots in piping.

Maintain vacuum on system for minimum of 5 hours after closing valve between vacuum pump and system.

Break vacuum with refrigerant gas, allow pressure to build up to 2 psi.

Complete charging of system, using new filter dryer core in charging line. Provide full operating charge.

END OF SECTION 232300

SECTION 233113

METAL DUCTWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract.

Product data including details of construction relative to materials, dimensions of individual components, profiles, and finishes for the following items:

Sealing Materials.

Fire-Stopping Materials.

Shop drawings from duct fabrication shop, drawn to a scale not smaller than 3/8 inch equals 1 foot, on drawing sheets same size as the Contract Drawings, detailing:

Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.

Duct layout, indicating pressure classifications and sizes in plan view. For exhaust ducts systems, indicate the classification of the materials handled as defined in this Section.

Fittings.

Reinforcing details and spacing.

Seam and joint construction details.

Penetrations through fire-rated and other partitions.

Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.

Coordination drawings for ductwork installation in accordance with "Basic Mechanical Requirements." In addition to the requirements specified in "Basic Mechanical Requirements" show the following:

Coordination with ceiling suspension members.

Spatial coordination with other systems installed in the same space with the duct

systems.

Coordination of ceiling- and wall-mounted access doors and panels required to provide access to dampers and other operating devices.

Coordination with ceiling-mounted lighting fixtures and air outlets and inlets.

Record drawings including duct systems routing, fittings details, reinforcing, support, and installed accessories and devices, in accordance with "Basic Mechanical Requirements" and Division contract.

Maintenance data for volume control devices, fire dampers, and smoke dampers, in accordance with "Basic Mechanical Requirements" and contract.

1.03 QUALITY ASSURANCE

NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

1.04 DELIVERY, STORAGE, AND HANDLING

Deliver sealant and fire-stopping materials to site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

Store and handle sealant fire-stopping materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

Deliver and store stainless steel sheets with mill-applied adhesive protective paper, maintained through fabrication and installation.

PART 2 - PRODUCTS

2.01 SHEET METAL MATERIALS

Sheet Metal, General: Provide sheet metal in thicknesses indicated, packaged and marked as specified in ASTM A 700.

Galvanized Sheet Steel: Lock-forming quality, ASTM A 527, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.

Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum and stainless steel

ducts provide reinforcing of compatible materials.

Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

Range hood exhaust and make-up air ductwork shall be fabricated of 314 stainless steel and shall comply with the NYC building code and NFPA 96.

2.02 DUCT LINER

General: Comply with NFPA Standard 90A and TIMA Standard AHC-101.

Materials: ASTM C 1071, Type II, with coated surface exposed to airstream to prevent erosion of glass fibers.

Thickness: 1 inch.

Thermal Performance: "K-Factor" equal to 0.28 or better, at a mean temperature of 75 deg F.

Fire Hazard Classification: Flame spread rating of not more than 25 without evidence of continued progressive combustion and a smoke developed rating of no higher than 50, when tested in accordance with ASTM C 411.

Liner Adhesive: Comply with NFPA Standard 90A and ASTM C 916.

Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct. Provide fasteners that do not damage the liner when applied as recommended by the manufacturer, that do not cause leakage in the duct, and will indefinitely sustain a 50-pound tensile dead load test perpendicular to the duct wall.

Fastener Pin Length: As required for thickness of insulation, and without projecting more than 1/8 inch into the airstream.

Adhesive For Attachment of Mechanical Fasteners: Comply with the "Fire Hazard Classification" of duct liner system.

2.03 SEALING MATERIALS

Joint and Seam Sealants, General: The term sealant used here is not limited to materials of adhesive or mastic nature, but also includes tapes and combinations of open weave fabric strips and mastics.

Joint and Seam Tape: 2 inches wide, glass-fiber-fabric reinforced.

Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with the tape to form a hard, durable, airtight seal.

Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.

Flanged Joint Mastics: One-part, acid-curing, silicone elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

2.04 FIRE-STOPPING

Fire-Resistant Sealant: Provide two-part, foamed-in-place, fire-stopping silicone sealant formulated for use in a through-penetration fire-stop system for filling openings around duct penetrations through walls and floors, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

Fire-Resistant Sealant: Provide one-part elastomeric sealant formulated for use in a through-penetration fire-stop system for filling openings around duct penetrations through walls and floors, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

Products: Subject to compliance with requirements, provide one of the following:

- "Dow Corning Fire Stop Sealant"; Dow Corning Corp.
- "3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M.
- "RTV 7403"; General Electric Co.
- "Fyre Putty"; Standard Oil Engineered Materials Co.

2.05 HANGERS AND SUPPORTS

Building Attachments: Concrete inserts, powder actuated fasteners, or structural steel fasteners appropriate for building materials. Do not use powder actuated concrete fasteners for lightweight aggregate concretes or for slabs less than 4 inches thick.

Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.

Hangers Installed In Corrosive Atmospheres: Electro-galvanized, all-thread rod or hot-dipped-galvanized rods with threads painted after installation.

Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards, 1985 Edition, for sheet steel width and gage and steel rod diameters.

Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.

Where galvanized steel ducts are installed, provide hot-dipped-galvanized steel shapes and

plates.

2.06 RECTANGULAR DUCT FABRICATION

General: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.

Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.

Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.

Static Pressure Classifications: Except where otherwise indicated (schedule sheet), construct duct systems to the following pressure classifications:

Supply Ducts: 2 inches water gage.

Return Ducts: 2 inches water gage, negative pressure.

Exhaust Ducts: 3 inches water gage, negative pressure.

Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are lined or are externally insulated.

2.07 RECTANGULAR DUCT FITTINGS

Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," latest Edition, Figures 2-1 through 2-10.

2.08 SHOP APPLICATION OF LINER IN RECTANGULAR DUCTS

Adhere a single layer of indicated thickness of duct liner with 90 percent coverage of adhesive at liner contact surface area. Multiple layers of insulation to achieve indicated thickness is prohibited.

Apply a coat of adhesive to liner facing in direction of airflow not receiving metal nosing.

Butt transverse joints without gaps and coat joint with adhesive.

Fold and compress liner in corners of rectangular ducts or cut and fit to assure butted edge overlapping.

Longitudinal joints in rectangular ducts shall not occur except at corners of ducts, unless the size of the duct and standard liner product dimensions make longitudinal joints necessary.

Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely around perimeter; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.

Secure transversely oriented liner edges facing the airstream with metal nosings that are either channel or "Z" profile or are integrally formed from the duct wall at the following locations:

Fan discharge.

Intervals of lined duct preceding unlined duct.

Terminate liner with duct buildouts installed in ducts to attach dampers, turning vane assemblies, and other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to the duct wall with bolts, screws, rivets, or welds. Terminate liner at fire dampers at connection to fire damper sleeve through fire separation.

2.09 ROUND DUCT FABRICATION

General: "Basic Round Diameter" as used in this article is the diameter of the size of round duct that has a circumference equal to the perimeter of a given sized of flat oval duct. Except where interrupted by fittings, provide round and flat oval ducts in lengths not less than 12 feet.

Round Ducts: Fabricate round supply ducts using seam types identified in SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figure 3-1, RL-1, RL-4, or RL-5. Seams Types RL-2 or RL-3 may be used if spot-welded on 1-inch intervals. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.

PART 3 - EXECUTION

3.01 DUCT INSTALLATION, GENERAL

Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.

Install ducts with the fewest possible joints.

Use fabricated fittings for all changes in directions, changes in size and shape, and connections.

Install couplings tight to duct wall surface with projections into duct at connections kept to a

minimum.

Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.

Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.

Install insulated ducts with 1-inch clearance outside of insulation.

Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.

Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

Non-Fire-Rated Partition Penetrations: Where ducts pass interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2 inches.

3.02 HANGING AND SUPPORTING

Install rigid round, rectangular, and flat oval metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.

Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.

Support vertical ducts at a maximum interval of 16 feet and at each floor.

Upper attachments to structures shall have an allowable load not exceeding 1/4 of the failure (proof test) load but are not limited to the specific methods indicated

Install concrete insert prior to placing concrete.

Install powder actuated concrete fasteners after concrete is placed and completely cured.

3.03 CONNECTIONS

Equipment Connections: Connect equipment with flexible connectors in accordance with Division 15 Section "Duct Accessories."

Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.

Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.

3.04 FIELD QUALITY CONTROL

Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.

3.05 ADJUSTING AND CLEANING

Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 15 Section "TESTING, ADJUSTING, AND BALANCING" for requirements and procedures for adjusting and balancing air systems.

Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION 233113

SECTION 233300

DUCTWORK ACCESSORIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction; and installation instructions.

Shop Drawings: Submit manufacturer's assembly-type shop drawings for each type of ductwork accessory showing interfacing requirements with ductwork, method of fastening or support, and methods of assembly of components.

1.03 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of ductwork accessories, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.

SMACNA Compliance: Comply with applicable portions of SMACNA "HVAC Duct Construction Standards, Metal and Flexible".

Industry Standards: Comply with ASHRAE recommendations pertaining to construction of ductwork accessories, except as otherwise indicated.

UL Compliance: Construct, test, and label fire dampers in accordance with UL Standard 555 "Fire Dampers and Ceiling Dampers".

NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems", pertaining to installation of ductwork accessories.

PART 2 - PRODUCTS

2.01 DAMPERS:

Low Pressure Manual Dampers: Provide dampers of single blade type or multiblade type, constructed in accordance with SMACNA "HVAC Duct Construction Standards".

Control Dampers: Provide dampers with parallel blades for 2- position control, or opposed blades for modulating control. Construct blades of 16-ga steel, provide heavy-duty molded self-lubricating nylon bearings, 1/2" diameter steel axles spaced on 9" centers. Construct frame of 2" x 1/2" x 1/8" steel channel for face areas 25 sq. ft. and under; 4" x 1-1/4" x 16-ga channel for face areas over 25 sq. ft. Provide galvanized steel finish with aluminum touch-up.

2.02 TURNING VANES:

Fabricated Turning Vanes: Provide fabricated turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".

Manufactured Turning Vanes: Provide turning vanes constructed of 1-1/2" wide curved blades set at 3/4" o.c., supported with bars perpendicular to blades set at 2" o.c., and set into side strips suitable for mounting in ductwork.

Acoustic Turning Vanes: Provide acoustic turning vanes constructed of airfoil shaped aluminum extrusion with perforated faces and fiberglass fill.

Manufacturer: Subject to compliance with requirements, provide turning vanes of one of the following:

Anemostat Products Div.; Dynamics Corp. of America.
Barber-Colman Co.
Hart & Cooley Mfg. Co.
Or approved equal.

2.03 DUCT HARDWARE:

General: Provide duct hardware, manufactured by one manufacturer for all items on project, for the following:

Test Holes: Provide in ductwork at fan inlet and outlet, and elsewhere as indicated, duct test holes, consisting of slot and cover, for instrument tests.

Quadrant Locks: Provide for each damper, quadrant lock device on one end of shaft; and end bearing plate on other end for damper lengths over 12". Provide extended quadrant locks and end extended bearing plates for externally insulated ductwork.

Manufacturer: Subject to compliance with requirements, provide duct hardware of one of the following:

Ventfabrics, Inc.
Young Regulator Co.

Or approved equal.

2.04 DUCT ACCESS DOORS:

General: Provide where indicated, duct access doors of size indicated.

Construction: Construct of same or greater gage as ductwork served, provide insulated doors for insulated ductwork. Provide flush frames for uninsulated ductwork, extended frames for externally insulated duct. Provide one size hinged, other side with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors.

Manufacturer: Subject to compliance with requirements, provide duct access doors of one of the following:

Air Balance Inc.
Duro Dyne Corp.
Register & Grille Mfg. Co., Inc.
Ruskin Mfg. Co.
Or approved equal.

2.05 FLEXIBLE CONNECTORS:

General: Provide flexible duct connections wherever ductwork connects to vibration isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and also capable of absorbing vibration of connected equipment.

Manufacturer: Subject to compliance with requirements, provide flexible connections of one of the following:

Duro Dyne Corp.
Flexaust (The) Co.
Ventfabrics, Inc.
Or approved equal.

2.06 FIRE DAMPERS:

Fabricated Fire Dampers: Provide dampers constructed in accordance with SMACNA "Fire Dampers and Heat Stop Guide".

Fire Dampers: Provide fire dampers, of types and sizes indicated. Construct casings of 11-ga galvanized steel with bonded red acrylic enamel finish. Provide fusible link rated at 160 to 165 degrees F (71 to 74 degrees C) unless otherwise indicated. Provide damper with positive lock in closed position, and with the following additional features:

Damper Blade Assembly: Curtain type.

Blade Material: Steel, match casing.

Blade Material: Stainless steel.

2.07 COMBINATION FIRE/SMOKE DAMPERS:

Ruskin Model FSD60 series combination fire smoke or approved equal. Ruskin model numbers and accessories provided for reference

Fire Resistance in accordance with UL555:

1-1/2 hours in 1 hour rated walls.

2 hours in 2 hour rated walls..

3 hours in 3 hour rated walls.

Smoke Rating:

Leakage Class I Smoke Damper in accordance with UL555S. A Class I smoke damper leaks no more than 8 cubic feet per minute at 4 in. wg. differential pressure.

Elevated Temperature Rating: 250°F.

Air Flow Rating: 2000 fpm.

Differential Pressure Rating: 4 in. wg.

Construction:

Frame: 5 inches x minimum 16 gage (127 x minimum 1.6 mm) roll formed, galvanized steel hat-shaped channel, reinforced at corners. Structurally equivalent to 13 gage (2.3 mm) U-channel type frame.

Blades:

Style: True airfoil-shaped, single piece, double skin.

Action: Opposed.

Material: Minimum 14 gage (2.0 mm) equivalent thickness, galvanized steel.

Width: Maximum 6 inches (152 mm).

Bearings: Self-lubricating stainless steel sleeve, turning in extruded hole in frame.

Seals:

Blade: Inflatable silicone fiberglass material to maintain smoke leakage rating to a minimum of 450°F and galvanized steel for flame seal to 1,900°F.

Mechanically attached to blade edge (glue-on or grip type seals are not acceptable).

Jamb: Stainless steel, flexible metal compression type.

Linkage: Concealed in frame.

Axles: Minimum ½ inch (13) diameter plated steel, hex-shaped, mechanically attached to blade.

Mounting: Vertical and/or Horizontal.

Temperature Release Device: Heat-Actuated, Quick Detect.

Close (in a controlled manner) and lock damper during test, smoke detection, power failure, or fire conditions through actuator closure spring. At no time shall actuator disengage from damper blades.

Allow damper to be automatically and remotely reset after test or power failure conditions. After exposure to high temperature or fire, inspect damper before reset to ensure proper operation.

Controlled closing and locking of damper in 7 to 15 seconds to allow duct pressure to equalize. Instantaneous closure is not acceptable.

Release Temperature: 165 degrees F.

Actuator:

Type: Electric 120 V, 60 Hz, two-position, fail close or Electric 24V, 60 Hz, two-position, fail close, as required.

Mounting: External.

Finish: Mill galvanized.

2.08 LOW LEAKAGE HVAC CONTROL DAMPERS:

Model: Ruskin Model CD60 series low leakage HVAC control dampers, or approved equal. Ruskin model numbers and accessories provided for reference

Ratings:

Leakage: Damper shall have a maximum leakage of 3 cfm/sq. ft. @1 in. wg. and shall be AMCA licensed as Class 1A.

Differential Pressure: Damper shall have a maximum differential pressure rating of 13 in. w.g. (3.2 kPa) for a 12 inch blade.

Velocity: Damper shall have a maximum velocity rating of 6,000 fpm (1,829 m/min).

Temperature: Damper shall be rated for -72 to 275 degrees F (-58 to 135 degrees C).

Construction:

Frame: 5 inches x minimum 16 gage (127 x minimum 1.6 mm) roll formed, galvanized steel hat-shaped channel, reinforced at corners. Structurally equivalent to 13 gage (2.3 mm) U-channel.

Blades:

Style: Airfoil-shaped, single-piece.

Action: Opposed.

Orientation: Horizontal.

Material: Minimum 14 gage (2.0 mm) equivalent thickness, galvanized steel.

Width: Nominal 6 inches (152 mm).

Bearings: Self-lubricating stainless steel sleeve, turning in extruded hole in frame.

Seals:

Blade: Extruded type for ultra-low leakage from -76 to 350 degrees F (-60 to 177 degrees C). Mechanically attached to blade edge.

Jamb: Flexible metal compression type.

Linkage: Concealed in frame.

Axles: Minimum 1/2 inch (13 mm) diameter plated steel, hex-shaped, mechanically attached to blade.

Mounting: Horizontal.

Finish: Mill galvanized.

Actuator:

Type: Electric 120 V, 60 Hz, two-position, fail close or Electric 24V, 60 Hz, two-position, fail close, as required.

Mounting: External.

ACCESSORIES

TS 150EZ Fire Stat:

UL classified dual temperature device allows the damper to be re-opened after initial closure from high heat.

Electrically and mechanically locks damper in closed position when duct temperatures exceed 165 degrees F

Allow damper to remain operable through a high limit temperature sensor for smoke management purposes while temperature is below 250 degrees F.

Indicator or Auxiliary Switch Packages: SP 100 Switch Package – Two position indicator switches linked directly to damper blade to remotely indicate damper blade position.

DSD – Duct Smoke Detector:

Model: DSDN.

Mounting: Factory Mounted.

Type: Ionization.

Factory Sleeve:

Minimum 20 gage thickness, minimum 17 inches long.

Silicone caulk factory applied to sleeve at damper frame to comply with leakage rating requirements.

Breakaway Connections: Ductmate.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION OF DUCTWORK ACCESSORIES:

Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.

Install turning vanes in square or rectangular 90 degree elbows in supply and exhaust air systems, and elsewhere as indicated.

Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter.

Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.

3.03 FIELD QUALITY CONTROL:

Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories, as required to obtain proper operation and leakproof performance.

3.04 ADJUSTING AND CLEANING:

Adjusting: Adjust ductwork accessories for proper settings, install fusible links in fire dampers and adjust for proper action.

Label access doors in accordance with Division-15 section "Mechanical Identification".

Final positioning of manual dampers is specified in Division- 15 section "Testing, Adjusting, and Balancing".

Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

3.05 EXTRA STOCK:

Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

END OF SECTION 233300

SECTION 233400

CENTRIFUGAL FANS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this Section.

Requirements of the following Sections apply to this section:

"Basic Mechanical Requirements."

"Basic Materials and Methods."

1.02 SUMMARY

This Section includes the following types of centrifugal fans:

- Centrifugal fans
- Centrifugal Roof Fans
- Inline centrifugal fans.
- Propellar Exhaust Fans
- Ceiling mounted fans.

1.03 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:

Product data for selected models, including specialties, accessories, and the following:

Certified fan performance curves with system operating conditions indicated.

Certified fan sound power ratings.

Motor ratings and electrical characteristics plus motor and fan accessories.

Materials gages and finishes, including color charts.

Dampers, including housings, linkages, and operators.

Shop drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, required clearances, components, and location and size of field connections.

Coordination drawings, in accordance with Division 15 Section "Basic Mechanical Requirements," for fan room layouts and for reflected ceiling plans drawn accurately to scale and coordinating penetrations and units mounted above ceiling. Show the following:

Ceiling suspension members.

Method of attaching hangers to building structure.

Size and location of initial access modules for acoustical tile.

Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinkler heads, access panels, and special moldings.

Wiring diagrams that detail power, signal, and control wiring. Differentiate between manufacturer-installed wiring and field-installed wiring.

Product certificates, signed by manufacturers of centrifugal fans, certifying that their products comply with specified requirements.

1.04 QUALITY ASSURANCE

NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

1.05 DELIVERY, STORAGE, AND HANDLING

Lift and support units with the manufacturer's designated lifting or supporting points.

Disassemble and reassemble units as required for movement into the final location following manufacturer's written instructions.

Deliver fan units as a factory-assembled unit to the extent allowable by shipping limitations, with protective crating and covering.

1.06 SEQUENCING AND SCHEDULING

Coordinate the size and location of concrete equipment pads. Cast anchor bolt inserts into pad.

Coordinate the size and location of structural steel support members.

1.07 EXTRA MATERIALS

Furnish one additional complete set of belts for each belt-driven fan.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Centrifugal Roof Fans:

Cook (Loren) Co.
Greenheck Fan Corp.
Penn Ventilator corp.
Or Approved Equal.

Inline Centrifugal Fans:

Cook (Loren) Co.
Greenheck Fan Corp.
Penn Ventilator corp.
Or Approved Equal.

Ceiling-Mounted Fans:

Carnes Company, Inc.
Greenheck Fan Corp.
Penn Ventilator corp.
Or Approved Equal.

Propeller Exhaust Fans:

Carnes Company, Inc.
Greenheck Fan Corp.
Penn Ventilator corp.
Or Approved Equal.

Utility Fans:

Carnes Company, Inc.
Cook (Loren) Co.
Greenheck Fan Corp.
Or Approved Equal.

2.02 SOURCE QUALITY CONTROL

Testing Requirements: The following factory tests are required:

Sound Power Level Ratings: Comply with AMCA Standard 301 "Method for Calculating Fan Sound Ratings From Laboratory Test Data." Test fans in accordance with AMCA Standard 300 "Test Code for Sound Rating." Fans shall be licensed to bear the AMCA Certified Sound Ratings Seal.

Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings in accordance with AMCA Standard 210/ASHRAE Standard 51 - Laboratory Methods of Testing Fans for Rating.

2.03 FANS, GENERAL

General: Provide fans that are factory fabricated and assembled, factory tested, and factory finished, with indicated capacities and characteristics.

Fans and Shafts: Statically and dynamically balanced and designed for continuous operation at the maximum rated fan speed and motor horsepower.

Fan Shaft: Turned, ground, and polished steel, designed to operate at no more than 70 percent of the first critical speed at the top of the speed range of the fan's class.

Belt Drives: Factory mounted, with final alignment and belt adjustment made after installation.

Service Factor: 1.4.

Belts: Oil-resistant, nonsparking, and nonstatic.

Motors and Fan Wheel Pulleys: Adjustable pitch for use with motors through 15 HP; fixed pitch for use with motors larger than 15 HP. Select pulley so that pitch adjustment is at the middle of the adjustment range at fan design conditions.

Belt Guards: Provide steel belt guards for motors mounted on the outside of the fan cabinet.

Shaft Bearings: Provide type indicated, having a median life "Rating Life" (AFBMA L(50)) of 200,000, calculated in accordance with AFBMA Standard 9 for ball bearings and AFBMA Standard 11 for roller

bearings.

Factory Finish: The following finishes are required:

Sheet Metal Parts: Prime coating prior to final assembly.

Exterior Surfaces: Baked-enamel finish coat after assembly.

2.04 CENTRIFUGAL ROOF FANS

General Description: Belt-driven or direct-drive as indicated, centrifugal consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

Housing: Heavy-gage, removable, spun-aluminum, dome top and outlet baffle; square, one-piece, hinged aluminum base with venturi inlet cone.

Fan Wheel: Aluminum hub and wheel with backward-inclined blades.

Belt-Driven Drive Assembly: Resiliently mounted to the housing, with the following features:

Pulleys: Cast-iron, adjustable-pitch.

Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.

Fan Shaft: Turned, ground, and polished steel drive shaft keyed to wheel hub.

Fan and motor isolated from exhaust air stream.

Accessories: The following items are required as indicated:

Disconnect Switch: Nonfusible type, with thermal overload protection mounted inside fan housing, factory-wired through an internal aluminum conduit.

Bird Screens: Removable 1/2-inch mesh, 16-gage, aluminum or brass wire.

Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base, factory set to close when fan stops.

Blades: Die-formed sheet aluminum.

Frame: Extruded aluminum, with waterproof, felt blade seals.

Roof Curbs: Prefabricated, heavy-gage, galvanized steel; mitered and welded corners; 2-inch-thick, rigid, fiberglass insulation adhered to inside walls; built-in cant and mounting flange for flat roof decks; and 2-inch wood nailer. Size as required to suit roof opening and fan base.

Overall Height: 12 inches.

2.05 INLINE CENTRIFUGAL FANS

General Description: Inline, belt-driven, centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, drive assembly, motor and disconnect switch, mounting brackets, and accessories.

Housing: Split, spun-aluminum housing, with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.

Direct-Drive Units: Motor encased in housing out of air stream, factory-wired to disconnect located on outside of fan housing.

Belt-Drive Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

Wheel: Aluminum, airfoil blades welded to aluminum hub.

Accessories: The following accessories are required as indicated:

Volume Control Damper: Manual operated with quadrant lock, located in fan outlet.

Companion Flanges: For inlet and outlet duct connections.

Fan Guards: Expanded metal in removable frame.

Speed Control: Variable speed switch with on-off control and speed control for 100 to 50 percent of fan air delivery.

2.06 CEILING-MOUNTED FANS

General Description: Centrifugal fan designed for installation in ceiling, wall, or concealed inline applications.

Housing: Galvanized steel lined with acoustical insulation.

Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.

Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.

Remote Fan Speed Control: Solid state, capable of controlling fan speed from full speed to approximately half speed.

2.07 PROPELLER EXHAUST FANS

General Description: Belt-driven propeller fans consisting of housing, wheel, butterfly-type discharge damper, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

Propellers shall be constructed with fabricated steel, fabricated aluminum, or cast aluminum blades and hubs. Propellers shall be securely attached to fan shafts. All propellers shall be statically and dynamically balanced.

Motors shall be permanently lubricated, heavy duty type, carefully matched to the fan load and furnished at the specified voltage, phase, and enclosure.

Ground and polished steel fan shafts shall be mounted in permanently lubricated, sealed ball bearing pillow blocks.

Bearings shall be selected for a minimum (L10) life in excess of 100,000 hours at maximum cataloged operating speeds. Drives shall be sized for a minimum of 150 percent of driven horsepower.

Pulleys shall be of the fully machined cast iron type, keyed and securely attached to wheel and motor shafts.

Motor sheaves shall be adjustable for system balancing.

Drive frame and panel assemblies shall be galvanized steel or painted steel. Drive frames shall be formed channels and fan panels shall have prepunched mounting holes,

2.08 UTILITY FANS

General Description: Belt-driven, centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and accessories.

Housings: Fabricated of heavy-gage steel with side sheets fastened to scroll sheets by means of welding or deep lock seam.

Inlet: Round duct collar.

Discharge: Slip-joint duct connection.

Housings Discharge Arrangement: Adjustable to 8 standard positions.

Fan Wheels: Single-width, single-inlet, welded to cast-iron or cast-steel hub and spun steel inlet cone,

with hub keyed to the shaft.

Blade Materials: Steel.

Blade Type: Backward-curved, die-formed.

Blade Type: Forward-curved, die-formed.

Shaft Bearings: Prelubricated and sealed, self-aligning, pillow- block-type ball bearings.

Accessories: The following accessories are required where indicated:

Backdraft Dampers: Gravity-actuated with counterweight and interlocking aluminum blades and felt edges in steel frame installed on fan discharge.

Access Doors: Gasketed doors with latch-type handles.

Scroll Dampers: Single-blade damper installed at fan scroll top with adjustable linkage.

Spark-Resistant Construction: AMCA construction option A, B, or C as indicated.

Inlet Screens: Removable, heavy wire mesh.

Weather Hoods: Weather-resistant with stamped vents over motor and drive compartment.

2.09 FAN MOTORS

Torque Characteristics: Sufficient to accelerate the driven loads satisfactorily.

Motor Sizes: Minimum sizes and characteristics as indicated. If not indicated, large enough so that the driven load will not require the motor to operate in the service factor range.

Temperature Rating: 50 deg C maximum temperature rise at 40 deg C ambient for continuous duty at full load (Class A Insulation).

Service Factor: 1.15 for polyphase motors and 1.35 for single-phase motors. Provide permanent-split capacitor classification motors for shaft-mounted fans and capacitor start classification for belted fans.

Motor Construction: NEMA Standard MG 1, general purpose, continuous duty, Design B.

Bases: Adjustable.

Bearings: The following features are required:

Ball or roller bearings with inner and outer shaft seals.

Grease lubricated.

Designed to resist thrust loading where belt drives or other drives produce lateral or axial thrust in motor.

Enclosure Type: The following features are required:

Open drip-proof motors where satisfactorily housed or remotely located during operation.

Guarded drip-proof motors where exposed to contact by employees or building occupants.

Overload protection: Built-in, automatic reset, thermal overload protection.

Noise rating: Quiet.

Efficiency: Energy-efficient motors shall have a minimum efficiency as scheduled in accordance with IEEE Standard 112, Test Method B. If efficiency not specified, motors shall have a higher efficiency than "average standard industry motors" in accordance with IEEE Standard 112, Test Method B.

Nameplate: Indicate the full identification of manufacturer, ratings, characteristics, construction, and special features.

Starters, Electrical Devices, and Wiring: Electrical devices and connections are specified in Division 16.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, housekeeping pads, and other conditions affecting performance of fans.

Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

Install fans level and plumb, in accordance with manufacturer's written instructions. Support units as described below, using the vibration control devices indicated. Vibration control devices are specified in Division 15 Section "Vibration Controls."

Support floor-mounted units on concrete equipment bases using neoprene pads. Secure units to anchor bolts installed in concrete equipment base.

Support floor-mounted units on concrete equipment bases using housed spring isolators. Secure units to anchor bolts installed in concrete equipment base.

Suspended Units: Suspend units from structural steel support frame using threaded steel rods and vibration isolation springs.

Arrange installation of units to provide access space around air- handling units for service and maintenance.

3.03 CONNECTIONS

Duct installations and connections are specified in other Division Sections. Make final duct connections with flexible connections.

Electrical Connections: The following requirements apply:

3.04 FIELD QUALITY CONTROL

Manufacturer's Field Inspection: Arrange and pay for a factory- authorized service representative to perform the following:

Inspect the field assembly of components and installation of fans including piping, ductwork, and electrical connections.

Prepare a written report on findings and recommended corrective actions.

3.05 ADJUSTING, CLEANING, AND PROTECTING

Adjust damper linkages for proper damper operation.

Clean unit cabinet interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheel and cabinet.

3.06 MANUFACTURER START-UP

Final Checks Before Start-Up: Perform the following operations and checks before start-up:

Remove shipping, blocking, and bracing.

Verify unit is secure on mountings and supporting devices and that connections for piping, ductwork, and electrical are complete. Verify proper thermal overload protection is installed in motors, starters, and disconnects.

Perform cleaning and adjusting specified in this Section.

Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearings operations. Reconnect fan drive system, align belts, and install belt guards.

Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.

Verify manual and automatic volume control and that fire and smoke dampers in connected ductwork systems are in the full-open position.

Disable automatic temperature control operators.

Starting procedures for fans:

Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated RPM.

Replace fan and motor pulleys as required to achieve design conditions.

Measure and record motor electrical values for voltage and amperage.

Shut unit down and reconnect automatic temperature control operators.

Refer to Section "Testing, Adjusting, and Balancing" for procedures for air-handling-system testing, adjusting, and balancing.

END OF SECTION 233400

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SECTION 233516

VEHICLE EXHAUST SYSTEM

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with conditions of contract and Division 1 specification sections.

Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, location, and features for each required pipe hanger and support.

The following submittals and code compliance shall be required;

Record building dimensions, note vehicle type and prepare shop drawings that include: equipment position, dimensions, sizes, weights, performance data, and also location and size of field connections.

Product Data: Provide manufacturer's literature and data sheets indicating rating capacities, dimensions, weights, accessories, and electrical requirements, wiring diagrams, location and size of field connections.

Provide fan curves with specified operating point clearly plotted.

Submit fan sound level data for fan specified.

Manufacturer's Installation, Operation and Maintenance Manual, which outlines the procedures required for system installation, start up, operation and shut down. The instructions shall include the manufacturer's name, telephone number, model number, service manual number, parts list, and brief description of all equipment and the basic operating features. The maintenance instructions shall list routine maintenance procedures, and troubleshooting guide.

Certifications: International Quality System Standard ISO 9001 and ISO 14001 Certified. UL Certification: UL listing, 508A Industrial Control Panel bulletin. Compliance with: NFPA 1500, Chapter 7-1.6, 2000 International Mechanical Code 502.13, NIOSH CIB #50, OSHA, 1996 American Conference of Governmental Industrial Hygienists (ACGIH) Proposed Regulations for Benzene and Diesel Exhaust Fumes. Federal Communications Commission approvals.

Compliance with all State and Local mechanical, electrical and building codes: Uniform Mechanical Code (UMC), American Society of Manufacturing Engineers (ASME), National Electric Code (NEC), Uniform Building Code (UBC), American Institute of Steel Construction (AISC), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), American Society of Testing Materials (ASTM).

1.03 GENERAL

The function of the vehicle exhaust removal system will be to source capture 100% of the exhaust emissions directly at the tail pipe of the vehicle and exhaust those emissions to a specified area safely outside the building.

The exhaust system must not interfere with access to the vehicle, nor impede doorways/walkways/or exits that would endanger the welfare of fire personnel. Drooping loops of hose or the hose assembly touching the floor will not be permitted.

As safety to personnel is of the utmost importance, the system shall be so designed as not to whip or fly back into quarters upon disconnection. Vehicles shall be capable of exiting quarters at normal speed without causing damage to the system or taking any portion of the hose or nozzle assembly along with the exiting vehicle.

The fan shall automatically start prior to vehicle ignition.

The exhaust system must move with the vehicle in a forward or reverse direction of travel and have an automatic release design without any positive locking device or air bladder that clamps or binds to the tail pipe. No system that uses the vehicles tailpipe, as a pulling force will be considered.

The exhaust system shall utilize a minimum 5" or 6" diameter hose in order to insure that the exhaust system can accommodate vehicle apparatus checks; and not limited to just emergency departures. Any smaller hose does not offer the required cross sectional area considered adequate for the volume of hot exhaust fumes discharged during extended run times required during routine vehicle check procedures.

1.04 SYSTEM OPERATION

The auto-disconnect exhaust system shall be a 24-volt electromagnetic release type that captures 100% of the exhaust emissions directly from the tail pipe and discharges those emissions to a specific location by means of an exhaust fan. Upon emergency dispatch of the vehicle, the exhaust fan shall automatically start prior to the engine being energized. The exhaust fan shall remain in the "on" position for as long as any engine is running. Upon vehicle exit, the hose assembly remains connected to the tail pipe and automatically disconnects at a specified distance outside the door by de-energizing the electromagnet. The nozzle and hose assembly shall smoothly separate from the vehicle and safely retract to the stored position ready to connect to the vehicle upon reentry. Upon disconnection, the hose assembly shall not be permitted to swing wide or touch the floor, possibly endangering personnel or apparatus. The hose shall remain at the door, ready for reconnection. Once the

apparatus has left the building, the fan will automatically shut down after a preset time interval.

Upon return, the fan is automatically activated prior to vehicle entry and the nozzle is connected to the tail pipe in a standing position. Bending over to connect the exhaust system and expose the operator to harmful exhaust fumes is not permitted. No positive locking device or moving parts shall be permitted to be connected to the tail pipe. After the vehicle has been turned off, the fan can continues to operate for a preset time interval, normally two minutes.

1.05 SCOPE OF WORK

A licensed and insured Contractor shall furnish and install a Source Capture Emergency Vehicle Exhaust Extraction System as designed and specified for the station(s).

The Contractor shall provide and install a centrifugal exhaust fan with capacity for all connected vehicles and sized for expansion if specified.

The Contractor shall provide and install an automatic fan start control console. The control console and all internal components shall be UL listed and manufactured in accordance with UL standard 508A and bear the UL label.

The Contractor shall provide and install all ductwork.

The Contractor shall be responsible for the delivery, safe storage, and handling of the products and protect them from weather elements.

PART 2 - PRODUCTS

2.01 GENERAL

The equipment specified herein shall be a standard product of Nederman, Incorporated. Substitutions are not permitted.

2.02 SUCTION RAIL ASSEMBLY

The Suction Rail shall be a polished aluminum extrusion that is formed in a configuration such that the extrusion serves not only as a suction duct, but also as the guide rail that the extraction trolley travels in. The wall thickness of the aluminum extrusion shall be no less than .1043". The weight of the aluminum extrusion is 4.5 lbs. per lineal foot. The area of the aluminum extrusion, in a cross-sectional view, shall have the minimum equivalent area of .2035 sq. ft. with an overall length as specified and indicated on the drawings. Each open end of the suction rail shall be covered with an end cap that can also be used as a round duct outlet for 6" diameter exhaust duct. As an alternate outlet, one or more rectangular-to-round transitions can be mounted on the topside of the suction rail after the cutout has been made per the manufacturer's specified size. A pair of EPDM rubber seals is installed at the bottom of the extrusion opening. The rubber seals have a Teflon strip on the inside surface which enables the trolley to travel smoothly and unhindered. The rubber seals close tightly during fan operation for an airtight seal, but open evenly around the trolley during trolley travel. The suction rail shall be supplied with internal rubber bumpers installed at both ends that serve as

the configuration of the suction rail. Spacing of the suspension attachments shall not exceed 15 feet center-to-center.

2.03 EXTRACTION TROLLEY ASSEMBLY

The Extraction Trolley Assembly serves as the component in the Rail System that travels in the suction rail, carries and supports the vertical hose assembly, balancer, current collectors, and trolley stop mechanism. The Extraction Trolley body shall be made of glass fiber composite with a low friction surface on both sides to enable the trolley to travel smooth through the rubber seal. Also, on a formed bracket mounted to the composite body, shall be a Disconnection box, acting as a circuit breaker for the Electro Magnet.

2.04 BALANCER

Integrated in the Extraction Trolley is a Balancer. The adjustable tension Balancer shall retract the hose and nozzle away from the vehicle as it leaves the building and safely suspend the assembly off the floor in the storage position when not in use. The Balancer shall be designed with a spring characteristics that ensure that the cord is wound onto the drum at a constant speed.

2.05 VERTICAL HOSE

The Upper Vertical Suction Hose shall be 6" in diameter, and of suitable flexibility to have a compression ratio of 6:1. The hose material shall be Trevira fabric covered with HYPALON (CSM, Chloro-sulfonated polyethylene). The hose shall be fire resistant according to DIN 4102 B1. The hose shall be capable of withstanding temperatures of 340 degrees Fahrenheit continuously, up to 370 degrees Fahrenheit on an intermittent usage basis. (NOTE: If a 'closed type sealed system' is being used, the temperature ratings must be 680°F and 740°F respectively.) The helix shall be external and made of galvanized steel or aluminum. The helix shall have high flexibility and be able to withstand oil, chemical, ozone and weather resistance.

2.06 NOZZLE

The nozzle is designed to capture 100% of the vehicle exhaust fumes generated at the vehicle tail pipe and is held in place by spring tension in conjunction with the electromagnet connection. The nozzle permits an ambient air mix in the air stream to immediately reduce exhaust emission temperatures up to 50% at the point of capture. The reduced air stream temperatures prolong component life by not permitting thermal breakdown of materials. The Nozzle shall be designed so as not to cause or create back pressure on any vehicle engine, nor draw raw diesel fumes into the exhaust hose while connected to a non-operating vehicle, nor create the possibility of spinning a non-lubricated turbo which could result in bearing failure. If a 'closed type sealed system' nozzle is utilized, a pressurized container is created presenting an explosive potential when drawing raw fumes from a non-operating vehicle and all system electrical components must be of explosion proof design. No closed system will be considered. These conditions are non-existent with an ambient air mix nozzle design.

The operator never has to touch the Nozzle for connection, but can position the Nozzle over the tail pipe while the operator grips the hose handle and simultaneously connects the electromagnet to the anchor plate. Tension will be automatically applied to the Nozzle created by an internal leaf spring assembly, which holds the Nozzle firmly in place over the tail pipe. The positioning of the electromagnet on the vehicle, combined with the tension created at the Nozzle, shall not allow the Nozzle to come away from the tail pipe until the electromagnet is either automatically or manually de-energized. The Nozzle shall be constructed of both metal and rubber, with no internal movable parts related to the connection of the Nozzle to the tail pipe. The Nozzle Hose shall be a minimum of 6" in diameter. The hose material shall be lightweight coated fiberglass with a smooth bore. The galvanized steel helix shall be completely rubber covered. The inlet diameter at the Nozzle is oversized to allow maximum airflow capacity for large engines and/or pump tests. The inlet boot of the Nozzle is to be made of EPDM rubber, and bonded to a sturdy 24 gauge steel conical reducer. The design of the nozzle shall allow for maximum flexibility to accept a variety of tail pipe configurations, which typically terminate at 90° to the side of the vehicle. Tail pipe adapters are not permitted nor required. No positive locking devices or a concept of a positive locking device, pneumatics, internal or external air hoses, wires, airbags, valves or precautionary devices for pneumatic bursting pressure shall be permitted or allowed.

2.07 ELECTROMAGNET ASSEMBLY

An electromagnet shall be used as the means of keeping the nozzle and hose assembly attached to the vehicle, whether at rest or as it moves to the point of exit. The electromagnet shall be 24 volts, DC with power supplied via an insulated conductor encapsulated within the helix of the upper hose. The electromagnet assembly shall consist of an electromagnet disc, a manual override switch, and an anchor plate. The electromagnet disc assembly shall be slightly recessed to serve as a guide for ease of connection to the anchor plate mounted on the vehicle and serve as the energized contact point. The formed collar shall be of a smooth and rounded configuration to prevent hooking or catching on external devices of the vehicle.

A manual override switch shall be easily accessible to disconnect the hose assembly while accessing storage compartments or performing vehicle maintenance. The manual override switch shall be conveniently mounted facing the operator. The purpose of the switch shall be to manually de-energize the electromagnet, allowing the hose and nozzle assembly to come away unrestrained from the vehicle when in the parked position within the building. The 24-volt UL switch shall be surrounded and mounted in a closed cell water resistant neoprene jacket.

The Anchor Plate shall be mounted on the vehicle to allow the operator, in an upright position, to connect the electromagnet. The Anchor Plate shall have an outer circular isolated holder made of hard resilient plastic. Recessed in the center of the holder shall be a finished steel disc to receive the electromagnet. The Anchor Plate shall be positioned on the vehicle in relation to the vertical and horizontal centerlines of the tail pipe outlet.

2.08 DISCONNECTION SWITCH

Affixed to the Rail near the exit door, shall be a permanent magnet, which in conjunction with the disconnection box causes a 24-volt electromagnet to disconnect the hose assembly from the vehicle. The separation of the entire hose assembly from the vehicle is a one step process

whereby no stress or strain is transferred from the vehicle to the exhaust hose or overhead brackets. Numerous mechanical functions to achieve nozzle separation such as valve activation, pneumatic deflation, and pulling forces to remove the nozzle from the tail pipe are not permitted. The disconnection switch shall be adjustable to create a nozzle release point at a specified distance as the vehicle exits the building. If a proper disconnect does not occur, the electromagnet has a built-in safety disconnection feature, which releases it with a 50-pound shear force. Then the hose and nozzle assembly remains intact. With other systems utilizing a mechanical or pneumatic direct connection to the tail pipe, a breakaway system is required to prevent the entire hose assembly from leaving the building with the vehicle.

2.09 END STOP

The Rail shall be equipped with an End Stop, one for each Trolley, which is designed to stop the travel of the entire hose, nozzle, and balancer assembly. The stopping action itself must be spring cushioned to prevent the assembly from coming to an abrupt and immediate halt. Each Extraction Trolley Assembly is equipped with a coiled spring hydraulic oil damper.

2.10 FAN AUTO-START

The Fan Auto-Start serves to act as a remote control for fan start up to ensure the exhaust system is always running whenever an emergency vehicle is in operation. Upon dispatch, the exhaust fan shall automatically start and be running at full rpm prior to engine start up via a radio frequency transmitter mounted within the vehicle. The fan stays on as long as any vehicle is in operation. Upon vehicle exit or shut down, a variable timer then activates and the fan automatically turns off after a variable timed cycle. Upon vehicle return, the transmitter shall automatically activate the exhaust fan prior to the vehicle entering the building. The fan remains in operation until all vehicles are turned off and the timer then activates. The FCC-approved transmitter does not interfere with any radio frequency transmissions.

2.11 CENTRIFUGAL FANS

The fan shall be a direct drive centrifugal type, high pressure, single width, single inlet as required or indicated. Impeller wheels shall be of a modified radial tip design, with top forward curve and airfoil thickness configuration characteristics. Impeller wheels shall be spark resistant and made of aluminum to prevent static electricity build up. The impeller shall be dynamically and static balanced, and of the non-overloading type to provide maximum efficiency while achieving quiet, vibrations free operation. The fan housing shall be manufactured from cast aluminum. The fan and motor assembly shall be mounted on a galvanized steel frame, which shall protect the motor, while also serving as a mounting platform for field installation.

For fans 5 HP and larger, centrifugal fans shall be fully enclosed, single-width, single-inlet steel construction as required or indicated. Impeller wheels shall have backward inclined or backward curved blades of the non-overloading type. The bearings shall be self-aligned ball bearing type permanently sealed and lubricated. Fan shafts shall be steel and rotate in a non-sparking aluminum rubbing ring. Fans shall be accurately finished, and shall be provided with key and

key seats for impeller hubs and fan pulleys. The fans shall be furnished with factory finish protective weather coating and a drain kit. The motor shall be totally enclosed fan cooled (TEFC). Motor starters shall be magnetic with general-purpose enclosures. The fan shall be structurally supported and provided with vibration isolators as specified to ensure quiet and smooth operation. The exhaust discharge outlet shall be in compliance with ACGIH recommendations and EPA requirements. Air intakes, windows, cascade systems, prevailing currents, communications equipment and building aesthetics will be considered in the final location of the fan. Exhaust filtration systems will be provided upon request and silencers will be provided when needed. All fans are tested in accordance with AMCA Standards in an AMCA approved test facility.

2.12 AIR FLOW PERFORMANCE

Fan capacity shall be sized as such as to deliver a minimum of 600 cfm (or as otherwise specified) at each hose drop to the vehicle being served. The delivered volume shall take into account all lengths of ductwork, elbows, and branches, shut off, wyes, etc., which accumulate the static pressure at the fan inlet. Manufacturer provided fans shall be performance guaranteed.

2.13 DUCT WORK

Ducts, unless otherwise specified or approved, shall be round and conform to the dimensions as shown on the drawings. Ducts shall be straight and smooth on the inside with airtight joints. Wherever ducts are used with crimped ends, the joint shall have crimp and bead arrangement. The bead shall provide a rigid stop for the mating open end to seat. Ducts shall be constructed of galvanized steel and sealed in accordance with standard SMACNA methods, for the system designed negative pressure in inches w.g. All duct joints to sealed and air tight.

2.14 DUCT FITTINGS

Reducing fittings shall have a minimum of 1" graduating increase in diameter per 8" in length. Elbows up to 12" in diameter shall have a centerline radius of not less than 1.5 times the diameter. Elbows beyond 12" in diameter shall have a centerline radius of not less than 2.5 times the diameter. Branches shall enter the mains at a specified angle of not less than 30° with the centerline of the main duct in the direction of airflow, unless otherwise indicated or approved.

Flexible connections to the main or branch duct shall be braced with approved metal straps or members.

2.15 CONNECTIONS

Where duct of dissimilar metals are connected, or where sheet metal connections are made to fan inlet and outlet, only an approved fireproof flexible connection shall be used. The connection shall be installed and securely fastened by zinc coated steel clinch type draw bands for round ducts.

2.16 FRAMED OPENINGS AND DUCT SLEEVES

Duct sleeves shall be provided for all round ducts ≤ 15 " diameter that pass through floors, walls, ceilings, or roofs. Sleeves in non-load bearing walls shall be fabricated of 20-gauge steel conforming to ASTM A 525. Sleeves in load bearing walls shall be fabricated of standard weight galvanized steel pipe conforming to ASTM A 53. Collars for round ducts ≤ 15 " shall be fabricated from 20 gauge galvanized steel. Round ducts > 15 " in diameter passing through floors, walls, ceilings, or roofs shall be installed through framed openings. Structural steel members for framed openings shall conform to ASTM A 36. Framed openings shall provide a 1" clearance between the duct and the opening. A closure collar of galvanized steel ≥ 4 " wide shall be provided on each side of the walls or floors where sleeves or framed openings are provided.

2.17 STACKHEAD

The exhaust discharge stack head will be a no loss type as recommended by ACGIH or as otherwise specified. The stack head design will protect against weather elements or introduction of debris.

2.18 DUCT TEST HOLES

Test holes with covers shall be provided where indicated or directed, in the duct and plenum to insert Pitot tubes to take air measurements for balancing the air moving system if required.

PART 3 - EXECUTION

3.01 EXHAUST SYSTEM

The exhaust removal system shall be installed as indicated and recommended by the manufacturer. Welding and brazing shall conform to ASME-17. Slip joints shall be sealed. Riser

duct shall be supported to the structure as indicated on the drawings. Main duct shall be attached to building structural members.

3.02 BUILDING SURFACE PENETRATIONS

All penetrations shall be sealed. Sleeves or framed openings shall be utilized where duct penetrates building surfaces. The space between the sleeve or framed opening and the duct shall be packed with mineral wool or approved material. Closure collars shall be installed around the duct on both sides of the penetrated surface. Collars shall fit tight against the building surfaces and snug around the duct.

3.03 GUIDE TRACK

Installation height of Guide Track shall be between 10' to 16' range or as otherwise indicated on the drawings. The Guide Track shall be installed approximately 14" from the side of the vehicle and ≥ 12 " away from the side edge of the exit door. The Guide Track for the exhaust system shall include corrosion resistant brackets for ease of mounting to structural channel, trusses, or angle iron. Brackets shall be a minimum of 0.125" thickness. Mounting bolts to be no less than 0.375" diameter (structural grade 8) for connection to steel frame. Bolts required for masonry installation shall be 0.5" x 3.5" expansion bolts, or 0.375" x 4" sleeve anchors for wall mount masonry connection.

Recommendation: UNISTRUT 1 5/8" or Angle Iron 2"x 2" x 3/16".

3.04 TESTS

Each exhaust system and inlet shall be balanced to produce the indicated air quantities within 10 percent at the conditions shown. Any fans with bearings shall be lubricated, and the speed, direction and rotation of each fan shall be checked and verified as running correctly. The running current of each motor shall be checked and verified as correct. Upon completion and prior acceptance of the installation, the exhaust system shall be tested at the operating conditions to demonstrate satisfactory functional and operating efficiency. The Contractor shall provide all instruments, facilities, and labor required to properly conduct the tests.

3.05 TRAINING

The Contractor, or authorized approved personnel, shall provide training to the Owner (or appointed representative) in the daily use of and maintenance of the vehicle exhaust removal system installed and specified herein.

3.06 QUALITY ASSURANCE

All workmanship, manufacturing procedures, airflow design, and materials shall be tested and performance guaranteed.

3.07 EQUIPMENT WARRANTY

The Contractor shall guarantee all materials, equipment and workmanship for a period of three (3) years from date of final acceptance of the complete job, against original defects of material and workmanship, or excessive wear or deterioration.

END OF SECTION 230529

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SECTION 233700

AIR OUTLETS AND INLETS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data for air outlets and inlets including the following:

Schedule of air outlets and inlets indicating drawing designation, room location, number furnished, model number, size, and accessories furnished.

Data sheet for each type of air outlet and inlet, and accessory furnished; indicating construction, finish, and mounting details.

Performance data for each type of air outlet and inlet furnished, including aspiration ability, temperature and velocity traverses; throw and drop; and noise criteria ratings. Indicate selections on data.

Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air outlet and inlet, indicating materials and methods of assembly of components.

1.03 QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of air outlets and inlets of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards:

ARI Compliance: Test and rate air outlets and inlets in accordance with ARI 650 "Standard for Air Outlets and Inlets".

ASHRAE Compliance: Test and rate air outlets and inlets in accordance with ASHRAE 70 "Method of Testing for Rating the Air Flow Performance of Outlets and Inlets".

AMCA Compliance: Test and rate louvers in accordance with AMCA 500 "Test Method for Louvers, Dampers and Shutters".

AMCA Seal: Provide louvers bearing AMCA Certified Rating Seal.

NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

Deliver air outlets and inlets wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.

Store air outlets and inlets in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

2.01 CEILING AIR DIFFUSERS:

General: Except as otherwise indicated, provide manufacturer's standard ceiling air diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

Performance: Provide ceiling air diffusers that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device as listed in manufacturer's current data.

Ceiling Compatibility: Provide diffusers with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems which will contain each type of ceiling air diffuser.

Types: Provide ceiling diffusers of type, capacity, and with accessories and finishes as listed on diffuser schedule. The following requirements shall apply to nomenclature indicated on schedule.

Diffuser Faces:

Square (SQ): Square housing, core of square concentric louvers, square or round duct connection.

Rectangular (RCT): Rectangular housing, core of rectangular concentric louvers, square or round duct connection.

Panel (PL): Square or rectangular housing extended to form a panel to fit in ceiling system module, core of square or rectangular concentric louvers, square or round duct connection.

Diffuser Mountings:

Flush (FL): Diffuser housing above ceiling surface with flush perimeter flange and gasket to seal against ceiling.

Lay-In (L-I): Diffuser housing sized to fit between ceiling exposed suspension tee bars and rest on top surface of tee bar.

Diffuser Accessories:

Equalizing Deflectors (E-D): Adjustable parallel blades in frame for straightening air flow.

Smudge Ring (S-R): Extension perimeter frame around diffuser, sized so induced air impinges on frame and not on ceiling.

Plaster Ring (P-R): Perimeter ring designed to act as a plaster stop and diffuser anchor.

Diffuser Finishes:

Finishes shall be as selected by the Architect.

following:

Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:

Anemostat Products Div.; Dymanics Corp. of America.
Titus Products Div.; Philips Industries, Inc.
Tuttle & Bailey; Div. of Interpace Corp.
Or Approved Equal.

2.02 WALL REGISTERS AND GRILLES:

General: Except as otherwise indicated, provide manufacturer's standard wall registers and grilles where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

Performance: Provide wall registers and grilles that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device and listed in manufacturer's current data.

Wall Compatibility: Provide registers and grilles with border styles that are compatible with adjacent wall systems, and that are specifically manufactured to fit into wall construction with accurate fit and adequate support. Refer to general construction drawings and specifications for types of wall construction which will contain each type of wall register and grille.

Types: Provide wall registers and grilles of type, capacity, and with accessories and finishes as listed on register and grille schedule. The following requirements shall apply to nomenclature indicated on schedule:

Register and Griller Materials:

Steel Construction (ST): Manufacturer's standard stamped sheet steel frame and adjustable blades.

Register and Grille Faces:

Horizontal Straight Blades (H-S): Horizontal blades, individually adjustable, at manufacturer's standard spacing.

Vertically Straight Blades (V-S): Vertical blades, individually adjustable, at manufacturer's standard spacing.

Register and Grille Patterns:

Single Deflection (S-D): 1-set of blades in face.

Double Deflection (D-D): 2-sets of blades in face, rear set at 90 degrees to face set.

Register and Grille Dampers:

Opposed Blade (O-B): Adjustable opposed blade damper assembly, key operated from face of register.

Register and Grille Accessories:

Register and Grille Finishes:

Colors and finishes shall be as selected by the Architect

Available Manufacturers: Subject to compliance with requirements, manufacturers offering registers and grilles which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide registers and grilles of one of the following:

Anemostat Products Div.; Dynamics Corp. of America.
Carnes Co.; Div. of Wehr Corp.
Titus Products Div.; Philips Industries, Inc.
Or approved equal.

2.03 LOUVERS:

General: Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

Performance: Provide louvers that have minimum free area, and maximum pressure drop of each type as listed in manufacturer's current data, complying with louver schedule.

Substrate Compatibility: Provide louvers with frame and sill styles that are compatible with adjacent substrate, and that are specifically manufactured to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to general construction drawings and specifications for types of substrate which will contain each type of louver.

Materials: Construct of aluminum extrusions, ASTM B 221, Alloy 6063-T52. Weld units or use stainless steel fasteners.

Louver Screens: On inside face of exterior louvers, provide 1/2" square mesh anodized aluminum wire insect screens mounted in removable extruded aluminum frames.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering louvers which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide louvers of one of the following:

Arrow United Industries, Inc.
Louvers & Dampers, Inc.
Penn Ventilator Co., Inc.
Ruskin Mfg. Co.
Or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine areas and conditions under which air outlets and inlets are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

General: Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended function.

Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.

Locate ceiling air diffusers, registers, and grilles, as indicated on general construction "Reflected Ceiling Plans". Unless otherwise indicated, locate units in center of acoustical ceiling module.

3.03 SPARE PARTS:

Furnish to Owner, with receipt, 3 operating keys for each type of air outlet and inlet that require them.

END OF SECTION 233700

SECTION 235533

GAS FIRED UNIT HEATER

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS

General: Submit the following in accordance with Conditions of Contract.

Product data including weights, dimensions, metal gages, and data on features and components. Include plan and elevation views of units, minimum clearances, and data on ratings and capacities.

Maintenance data for products for inclusion in "Operating and Maintenance Manual".

Wiring diagrams from manufacturers detailing requirements for electrical power and control wiring for heaters. Include ladder-type wiring diagrams for interlock and control wiring required for field installation. Differentiate between portions of wiring that are factory installed and portions that are to be field installed.

1.03 QUALITY ASSURANCE

Comply with the requirements of the NYC Building code, Fire Prevention Code and Uniform Building Code.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by the following:

Unit Heaters, Gas, Separated Combustion

Reznor

Modine Mfg. Co.
The Trane Co.
Or approved equal.

Provide high-efficiency, separated-combustion, power vented, gas-fired unit heaters where indicated on plans and as herein specified.

Unit heaters shall be equipped for use with natural gas. Gas connection shall be external to the cabinet.

The heater shall be equipped with a multi-cell, 4 pass serpentine style steel heat exchanger. Heat exchanger tubes shall be press fabricated of 409 stainless steel. All heat exchangers shall be fabricated with no welding or brazing, only tool pressed mechanical joints. All heat exchanger cells shall be designed with an aerodynamic cross section to provide maximum airflow.

The units shall incorporate a single, one piece burner assembly with a single orifice. The burner shall have a continuous wound close pressed stainless steel ribbon separating the flame from the burner interior. All units shall have a single venturi tube and orifice supplying fuel to a one-piece burner housing. Each heat exchanger cell shall use balanced draft induction to maintain optimum flame control.

Controls shall include a two-stage gas valve; direct spark multi-try ignition with electronic flame supervision with 100% lockout integrally controlled via a printed circuit control board. The control board shall also incorporate diagnostic lights, DIP switches for fan overrun settings, and a relay for fan only operation. All units shall be equipped with a safety limit switch. All controls shall be enclosed in the sealed control compartment to protect them from accidental damage, dust, and atmospheric corrosion. The control compartment shall be sealed and the access door shall be gasketed to prevent dirt, lint, dust, or other contaminants present in the heated space from entering the unit. The control compartment door shall be equipped with a safety interlock switch to prevent operation when the door is open.

The unit shall have a factory-installed power venter device to draw combustion air from outside of the building. The outside air shall enter the unit through a factory-installed round inlet air terminal on the rear of the heater.

The combustion air supply pipe and flue exhaust pipe shall be run in parallel from the heater to a factory supplied concentric adapter assembly, which allows for a single wall or roof penetration, to the vertical air inlet and vent terminal. The combustion air/venting system shall include a vibration isolated power venter motor and wheel assembly and a combustion air pressure switch. Unit Sizes 30-125 shall include a flame rollout switch.

Operation shall be controlled by an integrated circuit board that includes LED diagnostic indicator lights. Supply voltage connections shall be made in a sealed junction box. 24-volt control connections shall be made on an externally mounted terminal strip with connections

(W1, W2, R, and G). All internal wiring, both line and control voltages, shall be terminated by insulated terminal connectors to minimize shock hazard during service.

Each unit shall be equipped for use with 208/1 volt power supply.

All units will be equipped with a built-in disconnect switch.

The cabinet shall be low profile with a pre-coat or powdercoat RAL 1001 white paint finish. Finish shall be a minimum 80 gloss on G30 galvanized steel. The cabinet shall be constructed so that screws are not visible from the bottom, front, or sides, except for service panel and accessories. Unit construction shall incorporate a beveled front corner on control side for additional cabinet rigidity. All units shall be manufactured with a tooled drawn supply air orifice on the rear panel to reduce fan inlet noise.

The unit shall be designed for ceiling suspension featuring 3/8"-16 female threads at both 2-point and 4-point locations with no additional adapter kits.

The cabinet shall be equipped with RAL 3005 burgundy painted, roll-formed horizontal louvers. Louvers shall be spring held and adjustable for directing airflow.

The cabinet shall be equipped with a full safety fan guard with no more than 1-inch grill spacing. The enclosed motor and fan assembly shall be resiliently mounted to the cabinet to reduce vibration and noise.

The unit shall be designed with a full opening service access panel complete with screw closure attachment and lifting handle for removal. Service panel shall be fully gasketed and equipped with a safety interlock switch.

All components in the gas train, all standard electrical controls, and the power venter shall be within the sealed service compartment.

Minimum top clearance from combustibles shall be 4-inch. Minimum bottom clearance from combustibles shall be 1" for all units. Minimum clearance from combustibles on nonservice side shall be 2-inch.

Units shall be manufactured in an ISO 9002 certified facility.

2.02 TEMPERATURE CONTROL

Thermostat: Two-stage, 24-V a.c., wall-mounting type with 50-90 deg F operating range and "fan-only" switch.

2.03 FINISHES

External Casings and Cabinets: Baked enamel over corrosion-resistant treated surface.

PART 3 - EXECUTION

3.01 INSTALLATION AND CONNECTION

Installation and connection of gas-fired heaters and associated fuel and vent features and systems installed and connected in accordance with NFPA 54, applicable local codes and regulations, and manufacturer's printed installation instructions.

Connect gas piping in accordance with Section "Natural Gas Systems."

Connect vents in accordance with manufacturer's recommendations.

Suspended Units: Suspend from structure using threaded rods, spring hangers, and building attachments. Secure rods to unit hanger attachments. Adjust hangers so unit is plumb and level.

Spring hangers are specified in Section "Vibration Isolation."

Install controls as specified in Section "Electric Control System."

3.02 IDENTIFICATION

Identify heaters and connections in accordance with Section "Mechanical Identification."

3.03 MANUFACTURER START-UP

Test functions, operations, and control sequences and protective features. Adjust to assure operation is in accordance with design.

Correct deficiencies identified by tests and observations and retest until specified requirements are met.

3.04 CLEANING AND ADJUSTING

Cleaning: Upon completion of installation, inspect heaters and associated components. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer.

Adjusting: Make burner and other unit adjustments for optimum heating performance and efficiency. Adjust heat distribution features, including louvers, vanes, shutters, dampers, and reflectors, to provide optimum heat distribution for objects, personnel, and spaces served.

3.05 DEMONSTRATION

Training: Arrange and pay for the services of a factory-authorized service representative to demonstrate adjustment, operation, and maintenance of heaters and heater systems and to train Owner's personnel.

Schedule training with at least 7-day advance notification.

END OF SECTION 235533

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SECTION 236213

ROOFTOP AIR CONDITIONING UNITS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, required clearances, weights, furnished specialties and accessories; and installation and start-up instructions.

Shop Drawings: Submit shop drawings detailing the manufacturer's electrical requirements for power supply wiring for rooftop heating and cooling units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.

Operation and Maintenance Data: Submit maintenance data and parts list for each rooftop unit, including "trouble-shooting" maintenance guide, servicing guide and preventative maintenance schedule and procedures. Include this data in maintenance manual.

1.03 QUALITY ASSURANCE:

Codes and Standards:

Units to comply with the requirements of the NYC Building Code, NYS Energy conservation Code, National Electric Code, NYC Fire Prevention and Uniform Building Code.

1.04 DELIVERY, STORAGE, AND HANDLING:

Handle rooftop units and components carefully to prevent damage. Replace damaged rooftop units or components with new.

Store rooftop units and components in clean dry place, off the ground and protect from weather, water, and physical damage.

Rig rooftop units to comply with manufacturer's rigging and installation instructions for unloading rooftop units, and moving them to final location.

1.05 SCHEDULING AND SEQUENCING:

Coordinate installation of units with the installation of the structural supports.

Coordinate roof opening locations with Structural and Architectural trades.

1.06 MAINTENANCE:

Extra Materials: Furnish to Owner, with receipt, the following spare parts for each rooftop air conditioning unit:

One set of matched fan belts for each belt-driven fan.

Each unit shall be provided with an optional throw-away filter. Provide three sets of filter for each unit. One filter shall be utilized during construction, one shall be installed prior to turning the equipment over to the Owner and one filter shall be turned over to the Owner as a spare.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, manufacturers offering rooftop units which may be incorporated in the work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide rooftop units of one of the following:

Carrier Air Conditioning; Div of Carrier Corp.
Trane (The) Co; Div of American Standard Inc.
York; Div of York International.
Or approved equal.

General Description: Units shall be factory-assembled and tested, designed for roof or slab installation, and consisting of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters, and dampers. Capacities and electrical characteristics are scheduled on the Drawings.

Casing: manufacturer's standard casing construction, having corrosion protection coating, and exterior finish. Casings shall have removable panels or access doors for inspection and access to internal parts, a minimum of 1/2" thick thermal insulation, knockouts for electrical and piping connections and an exterior condensate drain connection and lifting lugs.

Evaporator fans: forward-curved, centrifugal, belt-driven fans with adjustable sheaves or direct-driven fans; and permanently lubricated motor bearings.

Condenser fans: propeller-type, direct-driven fans with permanently lubricated bearings.

Coils:

General: Aluminum plate fin and seamless copper tube type. Fins shall have collars drawn, belled and firmly bonded to the tubes by means of mechanical expansion of the tubes. No soldering or tinning shall be used in the bonding process. Coils shall have a galvanized steel casing. Coils shall be mounted in the coil casing with same end connections accessible for service. Coils shall be removable from the unit through the roof or through the piping enclosure. Coil section shall be completely insulated.

Refrigerant cooling coils: have an equalizing type vertical distributor to ensure each coil circuit receives the same amount of refrigerant. Coils shall be proof (450 psig) and leak (300 psig) tested with air pressure under water, then cleaned, dehydrated, and sealed with a holding charge of nitrogen.

Compressors: serviceable, semi-hermetic, or fully hermetic compressors, complete with integral vibration isolators and crankcase heaters.

Safety controls: manual reset type for:

- low pressure cutout;
- high pressure cutout;
- compressor motor overload protection.
- anti-recycling timing device;

Economizer control: return and outside air dampers, outside air filter, fully modulating electric control system with enthalpy control, and adjustable mixed-air thermostat. System shall have 100 percent outside air capability. Provide automatic changeover through adjustable enthalpy control device.

Comply/coordinate with controls requirements in Section 230933 – Electric controls system and Section 230993 – Controls Sequence of Operations.

Accessories: Units shall include the following accessories as indicated or scheduled:

Low ambient control: head pressure control, designed to operate at temperatures down to 0 deg F.

Filters section: 2" thick fiberglass throwaway filters in filter rack.

PART 3 - EXECUTION

3.01 EXAMINATION:

Examine areas and conditions under which rooftop units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION:

General: Install rooftop units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

Electrical Connections: Refer to Electrical Specification - Electrical Connections for Equipment for final connections to equipment and installation of loose shipped electrical components.

3.03 DEMONSTRATION:

Start-Up Services:

Provide the services of a factory-authorized service representative to start-up rooftop units, in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

Operating and Maintenance Training:

Provide services of manufacturer's service representative to instruct Owner's personnel in operation and maintenance of rooftop units. Training shall include start-up and shut-down, servicing and preventative maintenance schedule and procedures, and troubleshooting procedures plus procedures for obtaining repair parts and technical assistance. Review operating and maintenance data contained in the Operating and Maintenance Manuals specified in Division One.

Schedule training with Owner, provide at least 7-day prior notice to the Construction Manager.

END OF SECTION 236213

SECTION 238126

DUCTLESS SPLIT AIR CONDITIONING UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

DDC General Conditions Section and Addendum to General Conditions.

1.02 SUBMITTALS:

Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, required clearances, weights, furnished specialties and accessories; and installation and start-up instructions.

Shop Drawings: Submit shop drawings detailing the manufacturer's electrical requirements for power supply wiring for rooftop heating and cooling units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.

Operation and Maintenance Data: Submit maintenance data and parts list for each rooftop unit, including "trouble-shooting" maintenance guide, servicing guide and preventative maintenance schedule and procedures. Include this data in maintenance manual; in accordance with requirements of Division 1.

1.03 SYSTEM DESCRIPTION

The variable capacity, heat pump air conditioning system shall be a Variable Refrigerant Volume Series (heat/cool model) split system. The system shall consist of multiple evaporators using PID controls, and VRV® model outdoor unit. The unit shall be a direct expansion (DX), air-cooled heat pump air-conditioning system, variable speed driven compressor multi zone split system, using R410A refrigerant. All indoor units are each capable of operating separately with individual temperature control.

The outdoor unit shall be interconnected to indoor units in accordance with the manufacturer's engineering data book detailing each available indoor unit. The indoor units shall be connected to the outdoor utilizing specified piping joints and headers.

Performance

1.04 OPERATING RANGE

The operating range in cooling will be 23°F DB ~ 115°F DB. The operating range in heating will be 0°F DB – 64°F DB / -5°F WB – 60°F WB.

1.05 REFRIGERANT PIPING

The system shall be capable of refrigerant piping up to 410 equivalent feet, a total combined length of 1000 feet of piping between the condensing and fan coil units with 165 feet maximum vertical difference, without any oil traps or additional equipment. In case where the outdoor unit is located below the indoor unit, the vertical difference is a maximum of 133 feet.

1.06 QUALITY ASSURANCE:

Codes and Standards:

The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.

All wiring shall be in accordance with the National Electric Code (NEC).

The system will bear the Energy Star label.

The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO). The system shall be factory tested for safety and function.

1.07 DELIVERY, STORAGE, AND HANDLING:

Unit shall be stored and handled according to the manufacturer's recommendation.

1.08 SCHEDULING AND SEQUENCING:

Coordinate installation of units with the installation of the structural supports.

1.09 WARRANTY:

The units shall have a manufacturer's warranty for a period of one (1) year from date of installation. The units shall have a limited labor warranty for a period of one (1) year from date of installation. The compressors shall have a warranty of six (6) years from date of installation. During the stated period, should any part fail due to defects in material and workmanship, it shall be repaired or replaced.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering rooftop units which may be incorporated in the work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide rooftop units of one of the following:

Daikin
Mitsubishi
Or approved equal.

2.02 OUTDOOR UNIT

General: The outdoor unit shall be designed specifically for use with VRV series components.

The outdoor unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of a Daikin scroll compressor, motors, fans, condenser coil, electronic expansion valve, solenoid valves, 4 way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports, liquid receivers and accumulators.

Both liquid and suction lines must be individually insulated between the outdoor and indoor units.

The outdoor unit can be wired and piped with outdoor unit access from left, right, rear or bottom.

The connection ratio of indoor units to outdoor unit will be 50% to 130%.

The sound pressure dB(A) at rated conditions shall be a value of 58 decibels at 3 feet from the front of the unit. The outdoor unit shall be capable of operating at further reduced noise during night time.

The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for re-programming.

The outdoor unit shall be modular in design and should allow for side-by-side installation with minimum spacing.

The following safety devices shall be included on the condensing unit; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, high pressure switch, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers. To ensure the liquid refrigerant does not flash when supplying to the various fan coil units, the circuit shall be provided with a sub-cooling feature. Oil recovery cycle shall be automatic occurring 1 hour after start of operation and then every 6 hours of operation.

The outdoor unit shall be capable of heating operation at 0°F dry bulb ambient temperature without additional low ambient controls.

The outdoor unit shall be completely weather proof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

The condensing unit shall consist of one propeller type, direct-drive fan 750 W motors that have multiple speed operation via a DC inverter. The condensing unit fan motor shall have multiple speed operation of the DC inverter type, and be of high external static pressure and shall be factory set as standard at 0.12 in. WG with available by field setting switch to a maximum 0.24 in. WG pressure. The fan shall be a vertical discharge configuration with an air flow of 7,400 cfm. The fan motor shall have inherent protection and permanently lubricated bearings and be mounted. The fan motor shall be provided with a fan guard to prevent contact with moving parts.

The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchanger, rifled bore tube design to ensure highly efficient performance. The coils shall be complete with corrosion treatment of an acrylic resin type. The thickness of the coating must be between 2.0 to 3.0 microns.

The scroll compressor shall be variable speed (PAM inverter) controlled which is capable of changing the speed to follow the variations in total cooling load as determined by the suction gas pressure as measured in the condensing unit. The inverter driven compressor in each condensing unit shall be of highly efficient reluctance DC, hermetically sealed scroll type with a maximum speed of 6,480 rpm. Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start. The capacity control range shall be 14% to 100%, with 29 individual capacity steps. Each non-inverter compressor shall also be of the hermetically sealed scroll type. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector. Oil separators shall be standard with the equipment together with an oil balancing circuit. The compressor shall be mounted to avoid the transmission of vibration.

The power supply to the outdoor unit shall be 208/230 volts, 3 phase, 60 hertz with a voltage range from 187 volts to 253 volts. The control voltage between the indoor and outdoor unit shall be 16VDC non-shielded 2 conductor cable. The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one outdoor unit with one 2-cable wire, thus simplifying the wiring operation. The control wiring lengths shall be run in accordance with the manufacturer's recommendations.

2.03 INDOOR UNITS

Ceiling Cassette Units

The Ceiling Cassette Indoor units shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate

drain pan, condensate drain pump, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.

Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.

Both refrigerant lines shall be insulated from the outdoor unit.

The 4-way supply air flow can be field modified to 3-way and 2-way airflow to accommodate various installation configurations including corner installations.

Return air shall be through the concentric panel, which includes a resin net mold resistant filter.

The indoor units shall be equipped with a condensate pan and condensate pump. The condensate pump provides up to 21" of lift.

The indoor units shall be equipped with a return air thermistor.

The indoor unit will be separately powered with 208~230V/1-phase/60Hz.

The voltage range will be 253 volts maximum and 187 volts minimum.

The cabinet shall be space saving and shall be located into the ceiling.

Three auto-swing positions shall be available to choose, which include standard, draft prevention and ceiling stain prevention.

The airflow of the unit shall have the ability to shut down one or two sides allowing for simpler corner installation.

Fresh air intake shall be possible by way of the manufacturer's fresh intake kit.

A branch duct knockout shall exist for branch ducting supply air.

The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

Each unit shall be provided with an optional throw-away filter. Provide three sets of filter for each unit. One filter shall be utilized during construction, one shall be installed prior to turning the equipment over to the Owner and one filter shall be turned over to the Owner as a spare.

The fan shall be direct-drive turbo fan type with statically and dynamically balanced impeller with high and low fan speeds available. The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz. The air flow rate shall be available in high and low speed settings. The fan motor shall be thermally protected.

Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 2 row cross fin copper evaporator coil with 17 FPI design completely factory tested.

The refrigerant connections shall be flare connections and the condensate will be 1 -1/4 inch outside diameter PVC. Condensate drain piping exterior to the units shall be copper. PVC condensate drain piping will not be acceptable. A condensate pan shall be located under the coil.

A condensate pump with a 21 inch lift shall be located below the coil in the condensate pan with a built in safety alarm.

A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range shall be 187 to 253 volts.

Control wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet with a total length not to exceed 6,560 feet. Control wiring between the indoor and remote controller shall be a maximum distance of 1,640 feet. The unit shall have controls provided by the manufacturer to perform input functions necessary to operate the system. The unit shall be compatible with interfacing with connection to LonWorks networks or interfacing with connection to BMS system.

Each unit shall be provided with a wall mounted, hard wired remote sensor kit is recommended for ceiling-embedded type fan coils, which often result in a difference between set temperature and actual temperature. The sensor for detecting the temperature can be placed away from the indoor unit.

Ceiling Concealed Units

The Ceiling Concealed Units shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, condensate drain pump, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit shall have an adjustable external static pressure switch.

Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.

Both refrigerant lines shall be insulated from the outdoor unit.

The indoor units shall be equipped with a condensate pan and condensate pump. The condensate pump provides up to 9-13/16" of lift.

The indoor units shall be equipped with a return air thermistor.

The indoor unit will be separately powered with 208~230V/1-phase/60Hz. The voltage range will be 253 volts maximum and 187 volts minimum. Switch box shall be reached from the side or bottom for ease of service and maintenance.

The cabinet shall be located into the ceiling and ducted to the supply and return openings. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

The fan shall be direct-drive Sirocco type fan, statically and dynamically balanced impeller with high and low fan speeds available. The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz .

The fan motor shall be thermally protected.

Each unit shall be provided with an optional throw-away filter. Provide three sets of filter for each unit. One filter shall be utilized during construction, one shall be installed prior to turning the equipment over to the Owner and one filter shall be turned over to the Owner as a spare.

Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 3 row cross fin copper evaporator coil with 14 FPI design completely factory tested.

The refrigerant connections shall be flare connections and the condensate will be 1 -1/4 inch outside diameter PVC. Condensate drain piping exterior to the units shall be copper. PVC condensate drain piping will not be acceptable. A condensate pan shall be located under the coil. A condensate pump with a 9-13/16" lift shall be located below the coil in the condensate pan with a built in safety alarm.

A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range shall be 187 to 253 volts.

Control wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet with a total length not to exceed 6,560 feet. Control wiring between the indoor and remote controller shall be a maximum distance of 1,640 feet. The unit shall have controls provided by the manufacturer to perform input functions necessary to operate the system. The unit shall be compatible with interfacing with connection to LonWorks networks or interfacing with connection to BMS system.

The unit shall have controls provided by the manufacturer to perform input functions necessary to operate the system. The unit shall be compatible with interfacing with connection to LonWorks networks or interfacing with connection to BMS system. Consult with Daikin prior to applying controls. Each unit shall be provided with a wall mounted, hard wired remote sensor kit is recommended for ceiling-embedded type fan coils, which often result in a difference between set temperature and actual

temperature. The sensor for detecting the temperature can be placed away from the indoor unit.

PART 3 - EXECUTION

3.01 EXAMINATION:

Examine areas and conditions under which rooftop units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION:

General: Install units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

Electrical Connections: Refer to Electrical Specifications - Electrical Connections for Equipment for final connections to equipment and installation of loose shipped electrical components.

3.03 DEMONSTRATION:

Pre-Installation Training

Retain the services of the manufacturer prior to the installation of the equipment to verify all piping runs, control wiring and installation of system components.

Start-Up Services:

Provide the services of a factory-authorized service representative to start-up ductless split AC units, in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

Manufacturer Start-up

Manufacturer shall provide commissioning services for the system to verify that the system is performing in accordance with the requirements of this contract.

Operating and Maintenance Training:

Provide services of manufacturer's service representative to instruct Owner's personnel in operation and maintenance of rooftop units. Training shall include start-up and shut-down, servicing and preventative maintenance schedule and procedures, and troubleshooting procedures plus procedures for obtaining repair parts and technical assistance. Review operating and maintenance data contained in the Operating and Maintenance Manuals specified in Division One.

Schedule training with Owner, provide at least 7-day prior notice to the Construction Manager.

END OF SECTION 238126

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SECTION 260500

BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

In the event of a discrepancy or contradiction between specifications and drawings, within the specifications, or between the specifications and the Construction Contract, the Owner and/or Architect shall decide which has precedence, and such decision shall be binding on the Contractor.

SUMMARY:

This Section specifies the basic requirements for electrical installations and includes requirements common to more than one section of Division 26.

It is the intent of the specifications and drawings to secure the provision of all materials, labor, equipment, permits, and services necessary to install complete, test, and leave ready for operation all work indicated. The work shall be complete with all necessary appurtenances, fittings, supports, etc. whether indicated or not.

CODES AND RULES:

All electrical work shall comply with applicable requirements of the latest editions of the following:

Electrical Code of the City of New York (NYCEC)
Building Code of the City of New York

All electrical work, materials, and equipment shall also be in strict conformance with FDNY standards.

Any corrections or modifications to the Drawings or Specifications required to comply with the above shall be brought to the attention of the Architect immediately.

Electrical materials, devices, and equipment shall be UL listed and labeled.

ROUGH-IN:

Verify final locations for rough-ins with Architectural Drawings, field measurements, and with the requirements of the actual equipment to be connected.

RELATED WORK:

All motors and motor-driven equipment will be furnished and installed under other Divisions, connected under this Division 26.

Casework and furniture with integral lighting fixtures and wiring assemblies will be furnished and erected by others; connections to building power shall be provided under this Division 26 as indicated.

Arrange for and provide temporary power, lighting, and wiring for all construction trades. Coordinate the source of construction power with the Owner.

Arrange for new electric power, telephone, and cable TV service to the new building with the applicable local providers. Provide raceways, boxes, devices, etc. as required by the service providers and install in strict accordance with providers' instructions and requirements.

ELECTRICAL INSTALLATIONS:

Coordinate electrical equipment and materials installation with other building components.

Verify all dimensions by field measurements.

Provide chases, slots, and openings in other building components as required for electrical installations.

Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work.

Perform all cutting and patching of building components to accommodate the installation of electrical equipment and materials.

Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, and with minimum of interference with other installations.

Circuiting of fixtures and devices shall be as shown on the Drawings. Any proposed modifications shall receive prior approval from the Architect.

If so directed by the Architect, the Contractor shall make minor modifications in the layout as needed to prevent conflict with existing conditions, work of other trades, or for proper execution of this work. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.

Coordinate the installation of electrical materials and equipment above ceilings with the suspension system, mechanical equipment and systems, and structural components.

TESTING:

Furnish all necessary meters, instruments, equipment and skilled labor to perform all tests and adjustments herein specified or otherwise required.

The Contractor shall be responsible for the safe and proper operation of all equipment and wiring installed and/or connected by him whether or not specific testing requirements are herein stated.

All electrical work shall be fully tested and left ready for operation.

All receptacles shall be tested for proper voltage and polarity.

Three phase receptacles shall be tested for proper phase rotation.

CUTTING AND PATCHING:

Do not endanger or damage installed work through procedures and processes of cutting and patching.

Arrange for repairs required to restore damage caused as a result of electrical installations.

No additional compensation will be authorized for cutting and patching work that is necessitated by ill-timed, defective, or non-conforming installations.

Perform cutting, fitting, and patching required to install equipment and materials in existing structures, uncover work to provide for installation of ill-timed work, remove and replace defective work; and to remove and replace work not conforming to requirements of the Contract Documents.

Upon written instructions from the Architect, uncover and restore work to provide for Architect's observation of concealed work.

Protect the structure, furnishings, finishes, and adjacent materials already installed.

ELECTRICAL SUBMITTALS:

Refer to Division 26 equipment and system sections for specific items requiring submittals. In general, all equipment and devices require submittals, except that basic construction materials (conduit, outlet boxes, 600 volt wire, etc.) generally do not.

PRODUCT OPTIONS AND SUBSTITUTIONS:

Where substitutions are proposed for specified equipment, or where selection is left to the Contractor, the Contractor shall be responsible for coordinating the equipment size with the allocated space and with the means of access to the space. Minimum safety and working clearances as dimensioned on the Drawings or required by NYCEC shall be maintained.

Where Contractor-proposed selections or substitutions require modifications to the design and layout, or require modifications to the work of other trades, the Contractor shall be fully responsible for any and all associated re-design and re-work costs. Submittals for such equipment shall include proposed dimensioned layout changes, where applicable.

When two or more items of same or similar material or equipment are required they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in work, except as otherwise indicated.

Provide products which are compatible within systems and with other connected items.

NAMEPLATE DATA:

Provide permanent operational data nameplate on each item of power operated equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

DELIVERY, STORAGE, AND HANDLING:

Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications, and adequately packaged and protected to prevent damage during shipment, storage, and handling.

Store equipment and materials at the site unless off-site storage is authorized in writing. Protect stored equipment and materials from damage and theft. Repair or replacement of stored items shall be at the Contractor's expense.

Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

RECORD DOCUMENTS:

Mark Drawings to indicate revisions to conduit size and location, both exterior and interior; actual equipment locations, dimensioned to column lines; concealed equipment, dimensioned to column lines; distribution and branch electrical circuitry; fuse and circuit breaker sizes and arrangements; support and hanger details; Change Orders; concealed control system devices; exact locations of buried conduits and cables.

Mark Specifications to indicate approved substitutions; Change Orders; actual equipment and materials used.

Upon completion of the installation and Owner's acceptance of the Work, deliver one (1) complete set of Drawings and Specifications so marked to the Owner.

END OF SECTION 260500

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SECTION 260519

WIRES AND CABLES

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of electrical wire and cable work is indicated by drawings and schedules.

Types of electrical wire and cable specified in this section include the following:

- Insulated conductors (600 volt and below)
- Armored cable (Type AC)

Raceways required for the installation of wires/cables are specified in other Division 26 sections.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable products of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing electrical wiring and cabling similar to that required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction, installation and color coding of electrical wires and cables.

UL Compliance: Comply with applicable requirements of UL Standards 4, 44, 83, 493, and/or 854. Provide wiring/cabling and connector products which are listed and labeled by UL or ETL.

UL Compliance: Comply with UL Std 486A, "Wire Connectors and Soldering Lugs for Use With Copper Conductors" including, but not limited to, tightening of electrical connectors to torque values indicated. Provide electrical connection products and materials which are listed and labeled by UL or ETL.

NEMA/ICEA Compliance: Comply with applicable requirements of NEMA/ICEA Standard No.'s WC-3, and/or WC7, and WC-30, "Color Coding of Wires and Cables", pertaining to electrical power type wires and cables.

ASTM Compliance: Comply with applicable requirements of ASTM B3, B8, B-193 and D-753.

DELIVERY, STORAGE, AND HANDLING:

Deliver wire and cable properly packaged in factory-fabricated type containers, or wound on NEMA-specified type wire and cable reels.

Store wire and cable in clean dry space in original containers. Protect products from weather, damaging fumes, construction debris and traffic.

Handle wire and cable carefully to avoid abrasing, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

PART 2 - PRODUCTS

WIRES AND CABLES:

Provide electrical wires and cables of manufacturer's standard materials, design, and construction as indicated by published product information, for a complete installation and for the applications indicated. Except as otherwise indicated, provide copper conductors with conductivity of not less than 98% at 20°C(68°F).

Conductors of #12 and #10 AWG sizes shall be solid. Conductors larger than #10 AWG shall be Class B stranded.

Conductors for control wiring shall be stranded #14 AWG, unless otherwise indicated or required.

Building Wires: Provide factory-fabricated wires of sizes, ampacity ratings, and materials suitable for the applications and services indicated. Where not indicated, provide proper wire selection to comply with project's installation requirements, NYCEC, and NEMA standards. Except where otherwise indicated, wire types for power, lighting, and Class 1 control circuits shall be as follows:

Type THHN/THWN, for dry and wet locations; maximum operating temperature 90°C (194°F) in dry locations, 75°C (167°F) in wet locations. The insulation shall be flame-retardant, moisture- and heat-resistant thermoplastic, with a nylon outer covering. The conductor shall be annealed copper.

Armored Cable: Where permitted, factory-assembled cables shall be metal-clad Type AC (BX) with copper conductors, 90°C. insulation, and a green-colored insulated ground conductor, conforming to UL4.

Conductors and cables for Class 2 signal and control circuits and for data and telecommunications circuits shall be as required for the application and as specified on the Drawings, Standards, or by the associated equipment manufacturer or system vendor. Jackets and insulation shall be approved for use in plenums without raceway.

CONNECTION MATERIALS AND COMPONENTS:

For each electrical connection indicated or required, provide a complete assembly of materials including, but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire-nuts, and other items and accessories as needed to complete splices and terminations of types indicated.

Connectors and Terminals: Provide electrical connectors and terminals which mate and match, including sizes and ratings, with equipment terminals and with the installed wires/cables, and which are recommended by the equipment manufacturer for intended applications.

Feeder taps #1/0 and larger: Provide pressure-type parallel clamp with insulating cover assembly, Burndy Type KPU-C or equivalent.

Taps and connections for #8AWG to #1AWG: Provide split-bolt connectors, with rubber tape or insulating putty to fill in voids and cover sharp edges, applied under multiple layers of vinyl insulating tape. Equivalent connectors with molded snap-on cover assemblies may be utilized when approved for the application.

Taps and connections for #14AWG to #10AWG: Provide twist-on insulated wire nuts with internal wire spring.

Electrical Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, wire nuts, and cable ties as recommended for use by their manufacturers for the types of services indicated or required.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which wires and cables are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

Do not install wires in raceways which are not clean and dry.

INSTALLATION OF WIRES AND CABLES:

Install electrical cables and wires as indicated, in compliance with applicable requirements of NYCEC, NEMA, and UL, and in accordance with recognized industry practices.

Feeders, appliance circuits, and motor circuits shall all be run in dedicated conduits unless specifically noted or shown otherwise.

Parallel feeders, when run in two or more conduits, shall have one conductor for each phase and neutral, plus one full-size ground conductor, in each of the conduits. All parallel conductors shall be of equal lengths.

Conductor sizes shall be as indicated on the Drawings. Where not indicated, provide per NYCEC - #12 AWG minimum for power and lighting circuits, #14 AWG for control circuits. For 15 and 20 ampere 120 volt circuit runs greater than 100 feet in length, use #10 AWG minimum.

All wiring shall be continuous between taps and terminations, without intermediate splices, unless otherwise indicated.

Coordinate wire/cable installation work with electrical raceway and equipment installation work as necessary to properly interface installation of wires/cables with other work.

Pull conductors simultaneously where more than one is being installed in same raceway.

Use pulling compound or lubricant where necessary. The compound used must not deteriorate conductor or insulation.

Use pulling means including fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway.

In finished offices and similar spaces only, and where concealed above ceilings or within walls and partitions, and where permitted by Codes, armored cable may be installed in lieu of conduit and wire for lighting and receptacle branch circuits. Above hung ceilings, support cables from the structure – do not leave lying on ceiling, ducts, or pipes.

INSTALLATION OF ELECTRICAL CONNECTIONS:

Install electrical connections as indicated and required, in accordance with equipment manufacturers' written instructions and with recognized industry practices, and complying with applicable requirements of UL and NYCEC to ensure that products fulfill requirements.

Connect electrical power supply, control, and signal conductors to equipment conductors or terminals in accordance with equipment manufacturers' written instructions and wiring diagrams.

Mate and match conductors of electrical connections for proper interface between field wiring and installed equipment.

Cover splices and taps with electrical insulating materials equivalent to, or of greater insulation rating, than the electrical insulation rating of those conductors being spliced or tapped.

Prepare cables and wires by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated. Exercise care to avoid cutting through tapes which will remain on conductors. Also avoid "ringing" copper conductors while skinning wire.

Trim cables and wires as short as practicable, and arrange routing to facilitate inspection, testing and maintenance, including application of a clamp-on ammeter.

Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Accomplish tightening by utilizing proper torquing tools, including torque screwdriver, beam-type torque wrench, and ratchet wrench with adjustable torque settings. Where manufacturer's torquing requirements are not available, tighten connectors and terminals to comply with torquing values contained in UL 486A.

FIELD QUALITY CONTROL:

All 600 volt rated wiring shall be given an insulation resistance test after installation in raceway, prior to connecting. Each conductor shall be tested with a 1000 VDC megger, both to ground and to all other conductors in the same raceway. If an insulation resistance reading of less than 100 megohms is obtained on any conductor, all wires in that raceway shall be removed and new wires installed. The removed wires shall not be re-used. Upon connection of both ends, insulation shall again be checked to ground only (with breakers open and fuses removed). If a reading of less than 100 megohms is obtained, make repairs or replacements as required. No circuit shall be energized prior to such test.

Upon completion of the installation of electrical connections, and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Correct malfunctioning units, then retest to demonstrate compliance.

END OF SECTION 260519

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SECTION 260526

GROUNDING

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

All electrical systems and equipment shall be grounded as herein specified, as shown on the Drawings, and in accordance with NYC Electrical Code.

Refer to other Division 26 sections for raceways, wires and cables, and other related work.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of grounding and bonding products and ancillary materials whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firms with at least 5 years of successful installation experience on projects with electrical grounding work similar to that required for this project.

Code Compliance: Comply with NYCEC as applicable to materials and installation of electrical grounding systems.

UL Compliance: Provide electrical grounding products and materials that are listed and labeled by UL or ETL for the application.

PART 2 - PRODUCTS

General: Provide electrical grounding and bonding products and materials as indicated or required, listed and approved for the use.

Conductors: Provide conductors in compliance with Division 26 specification section "Wires and Cables". Insulation color shall be green. For larger conductor sizes not available with green color insulation, provide bare tinned copper conductor or apply green vinyl color-coding tape over black insulation at all exposed termination points and at intermediate boxes.

Ground rods shall be steel core with welded copper exterior (Copperweld), 5/8" diameter x 10' long.

Each panelboard shall be provided with a copper equipment ground bus.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which electrical grounding connections are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

ELECTRIC SERVICE BONDING AND GROUNDING:

Install bonding jumpers at the service equipment between the grounded conductor (neutral) and the equipment ground.

Install grounding electrode conductor from the grounded service conductor to the metal underground water service pipe, building steel structure, and to a supplemental grounding electrode per Code and utility company requirements.

EQUIPMENT GROUNDING:

All metal raceways, boxes, and enclosures shall be installed and connected as an electrically-continuous assembly and shall be effectively grounded.

Feeders, motor circuits, appliance and receptacle branch circuits, and other circuits so indicated on the Drawings shall be provided with a green-insulated equipment ground conductor installed in the raceway or cable.

Lighting branch circuits may utilize metal raceway as the equipment ground conductor as permitted by Code.

FIELD QUALITY CONTROL:

Upon completion of installation work, test all circuits for grounding continuity and demonstrate compliance with requirements.

END OF SECTION 260526

SECTION 260533

RACEWAYS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of raceway work is indicated by drawings and schedules.

In architecturally finished areas, all raceways shall be concealed above ceilings and within hollow partitions unless otherwise indicated. In mechanical rooms, electrical rooms, and other unfinished areas, raceways shall be run exposed.

Types of raceways specified in this section include the following:

- Electrical metallic tubing (EMT)
- Flexible metal conduit
- Rigid metal conduit
- Rigid non-metallic conduit
- Metal wireways

Refer to other Division 26 sections for boxes and fittings, supporting devices, wires and cables, and other related work.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with electrical raceway work similar to that required for this project.

NEMA Compliance: Comply with applicable requirements of NEMA Standards Publications pertaining to raceways.

UL Compliance and Labeling: Comply with applicable requirements of UL safety standards pertaining to electrical raceway systems. Provide raceway products and components which have been listed and labeled by UL or ETL.

Code Compliance: Comply with applicable requirements of NYCEC pertaining to construction and installation of raceway systems. Provide raceway products and components which are approved for use in New York City.

PART 2 - PRODUCTS

CONDUIT AND TUBING:

Provide conduit, tubing, and fittings of types, grades, sizes and weights (wall thicknesses) for each service indicated. Where types and grades are not indicated, provide proper selection to fulfill wiring requirements, and comply with applicable portions of NYCEC.

Rigid Steel Conduit: Provide hot-dipped galvanized, threaded type, conforming to ANSI C80.1 and UL6.

Flexible Metal Conduit: Formed from continuous length of spirally wound, interlocked galvanized strip steel, conforming to UL 1.

Electrical Metallic Tubing (EMT): Galvanized steel, conforming to ANSI C80.3 and UL 797.

Rigid Non-Metallic Conduit: Schedule 40, 90 degree C, constructed of polyvinyl chloride (PVC) and conforming to NEMA TC-2, approved for direct burial.

Conduit and Tubing Accessories: Provide conduit and tubing accessories of types, sizes, and materials complying with manufacturer's published product information, which mate and match conduit and tubing to fulfill project requirements.

WIREWAYS:

Provide electrical wireways, troughs, and panel skirts of types, grades, and sizes indicated and suitable for the application. Provide wireways and troughs as a complete assembly including, but not limited to, couplings, offsets, elbows, tee fittings, expansion joints, adapters, hold-down straps, and end caps.

Wireways and troughs shall be constructed of code-gauge galvanized sheet metal with baked enamel finish, screw-on covers, and corrosion-resistant hardware. Construction shall be in compliance with UL 870. Wireways shall be UL listed.

Construction of custom panel skirts shall be similar to that of wireways, dimensions to match the associated panel, with removable front cover. Provide complete with screw-on adapter fittings at each end for a complete mechanical assembly.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which raceways are to be installed, and substrate which will support raceways. Notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

INSTALLATION OF RACEWAYS:

Install raceways as indicated, in accordance with manufacturer's written installation instructions and recognized industry practices, and in compliance with NYCEC.

Coordinate with existing conditions and with other trades as necessary to interface installation of electrical raceways and components with other work.

INSTALLATION OF CONDUITS:

Mechanically fasten together metal conduits, enclosures, and raceways for conductors to form a continuous enclosure. Connect to electrical boxes, fittings and cabinets to provide electrical continuity and firm mechanical assembly.

Routing of conduit and raceways, where shown, is approximate. Exact routing shall be determined by the Contractor to avoid structural interferences and interferences with other existing conditions. Where not shown, routing shall be determined by the Contractor subject to compliance with requirements.

Unless otherwise indicated or specified, all wiring shall be installed in metal raceways.

Conduits installed in Basement and Apparatus areas, outdoors, or where exposed to physical damage shall be rigid steel type.

Conduits installed in dry interior areas other than Basement and Apparatus areas shall be electrical metallic tubing (EMT).

Conduits installed underground or embedded in concrete slabs shall be Schedule 40 PVC.

Raceway sizes shall be as indicated on the Drawings, minimum 3/4 inch. Where size is not shown, it shall be sized by the Contractor as per the applicable code for the size, type, and quantity of wires contained. The Contractor may choose to install a larger size than shown for ease of wire installation, but in no case shall a smaller size be installed.

All conduit ends shall be reamed smooth and interiors shall be wiped clean and dry prior to or during the installation of wires.

Where conduits run above, adjacent to, or cross above a flue, steam or hot water pipe, maintain 6" minimum clearance.

Install expansion fittings or 2 foot long slack sections of flexible metal conduit in all conduit runs crossing building expansion joints. Expansion fittings, where used, shall be installed with bonding jumpers unless approved for use without.

All raceway penetrations through floor slabs and fire-rated walls and partitions shall be properly grouted and sealed to the satisfaction of the Architect, Owner, and Authorities Having Jurisdiction (AHJ). Where framed openings or sleeves are used for such penetrations, the annular space between conduit and sleeve or opening shall be sealed with an intumescent fire-stopping caulk or putty, such as 3M Brand Fire Barrier Caulk CP25 or equivalent.

Final connections to motors, lighting fixtures, duct-mounted smoke detectors, or any other equipment which requires a flexible connection for vibration isolation or ease of removal shall be made with flexible steel conduit. Lengths of flexible conduit shall be minimum 12", maximum as permitted by Code, unless otherwise noted. In exterior locations or wet areas, flexible conduit shall be PVC-jacketed liquidtight type with compatible fittings.

Conduit runs shall be straight and true, parallel and perpendicular to walls and floors, unless otherwise shown. Bends and offsets shall be uniform, symmetrical, and without kinks.

Field-bend conduit with benders designed for purpose so as not to distort nor vary internal diameter.

Conduits shall not cross pipe shafts or ventilating duct openings, pass through ventilation ducts, or interfere with lighting fixtures or other equipment.

Use of running threads at conduit joints and terminations is prohibited. Where required, use 3-piece union or split coupling.

Electric metallic tubing (EMT) shall be installed in accordance with NYCEC. EMT connectors and couplings shall be steel set-screw type. All connectors shall be insulated-throat type.

Rigid metal conduit shall be installed in accordance with NYCEC. All couplings and fittings shall be threaded. At sheet metal boxes and enclosures, connect conduit via double locknuts, with plastic insulating bushings on the conduit ends. Outdoors or in wet areas, locknuts shall be O-ring sealing type.

Underground conduits shall be installed minimum 24 inches below finished grade.

Avoid use of dissimilar metals throughout system to eliminate possibility of electrolysis. Where dissimilar metals are in contact, coat surfaces with corrosion inhibiting compound before assembling.

Install miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings, and plugs that have been specifically designed and manufactured for the particular application.

Use roughing-in dimensions as shown on Architectural Drawings or furnished by the equipment supplier. Set conduit and boxes for connection to units only after review of dimensions, and after checking locations with other trades.

Provide nylon pull cord in each empty conduit. Test conduits required to be installed, but left empty, with ball mandrel. Clear or replace any conduit which rejects ball mandrel.

Complete installation of electrical raceways before starting installation of cables/wires within raceways.

Conduit Fittings:

Use locknuts for securing conduit to metal enclosures with sharp edge for digging into metal, and ridged outside circumference for proper fastening.

Bushings for terminating conduits smaller than 1" are to have flared bottom and ribbed sides, with smooth upper edges to prevent injury to cable insulation.

Install insulated type bushings for terminating conduits 1" and larger. Bushings are to have flared bottom and ribbed sides. Upper edge to have phenolic insulating ring molded into bushing.

Bushings of standard or insulated type to have screw type grounding terminals, except where grounding terminal is provided on the locknut.

Miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings, and plugs to be specifically designed for their particular application.

All conduit fittings shall be provided with covers.

INSTALLATION OF WIREWAYS:

Mechanically assemble wireway sections to each other and to other enclosures and raceways for a complete mechanically and electrically continuous installation.

Wireways shall be installed level and plumb, securely mounted to the wall.

Installs covers and end caps on all wireways and troughs, leaving no section open.

END OF SECTION 260533

SECTION 260534

ELECTRICAL BOXES AND FITTINGS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of electrical box and associated fitting work is indicated by drawings and schedules, as required by NYCEC, and as required for ease of wiring installation.

Types of electrical boxes and fittings specified in this section include the following:

- Junction boxes
- Pull boxes
- Poke-thru devices
- Floor boxes
- Bushings
- Locknuts
- Knockout closures

Refer to other Division 26 sections for raceways, supporting devices, wires and cables, and other related work.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of electrical boxes and fittings, of types, sizes, and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects utilizing electrical boxes and fittings similar to those required for this project.

Code Compliance: Comply with NYCEC as applicable to construction and installation of electrical wiring boxes and fittings.

UL Compliance: Comply with applicable requirements of UL 50, UL 514-Series, and UL 886 pertaining to electrical boxes and fittings. Provide electrical boxes and fittings which are listed and labeled by UL or ETL.

NEMA Compliance: Comply with applicable requirements of NEMA Standards Pub. No.'s 0S1, 0S2 and Pub. No. 250 pertaining to outlet and device boxes, covers, and box supports.

SUBMITTALS:

Shop Drawings: Submit dimensioned drawings of all custom-fabricated (non-catalog) boxes and enclosures, including identification of all materials, devices, and finishes.

PART 2 - PRODUCTS

Outlet Boxes: Outlet boxes for recessed receptacles and lighting switches shall be galvanized sheet steel type, suitably sized for the wiring and devices contained. Provide boxes complete with all accessories for each installation and application, including supports, brackets, extension rings, fixture studs, cable clamps, device covers, etc.

Outlet boxes for surface-mounted applications shall be cast metal FS type with suitable device covers.

Junction and Pull Boxes: Provide galvanized code-gage sheet steel junction and pull boxes with screw-on covers. Types, shapes, and sizes shall suit each respective location and installation. Seams shall be welded. Equip with stainless steel nuts, bolts, screws and washers. In wet areas, boxes shall be neoprene-gasketed and shall be constructed to NEMA 4 requirements.

Poke-thru Devices: Provide UL-listed fire-rated combination power and communications poke-thru devices where indicated for above-grade flush floor outlets. Poke-thru devices shall be factory assembled with one (1) 20 ampere NEMA 5-20R duplex receptacle and provisions for four (4) open system keystone connectors. Devices shall be suitable for installation in a 4 inch diameter cored hole. Finish color as selected by Architect. Poke-thru devices shall be Walker RC3 Series as manufactured by Wiremold, or approved equal.

Floor Boxes: Provide cast iron fully adjustable rectangular floor boxes, number of gangs as indicated or to suit the application, for floor outlet applications where poke-thru devices cannot be utilized. Provide complete with matching brass carpet and tile flange and brass flip-lid device cover plate. Floor boxes and associated fittings shall be 880 Omnibox Series as manufactured by Wiremold, or approved equal.

Terminal Boxes: Provide UL-listed, gray enamel steel, NEMA 1 boxes with hinged cover, flush latch, interior back panel, and solderless box lug terminal strips; the number of terminals shall be as indicated or required (including spares). Each box shall be sized to allow 2-1/2 inches minimum clearance between the terminal strips and the side, top, and bottom of the box, and 4 inches minimum clearance between parallel terminal strips.

Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant box knockout closures, conduit locknuts, malleable iron conduit bushings, offset connectors, etc. of types and sizes to suit respective installation requirements and applications.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which electrical boxes and fittings are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF ELECTRICAL BOXES AND FITTINGS:

Install electrical boxes and fittings as indicated, in accordance with manufacturer's written instructions, applicable requirements of NYCEC, and in accordance with recognized industry practices to fulfill project requirements.

Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.

Coordinate exact locations and mounting heights of outlets with Architectural Drawings and furniture arrangements.

In all architecturally finished areas, outlet boxes shall be recessed in walls and ceilings. Provide device covers, extension rings, etc. as required to make the face of the outlet box flush with the finished surface.

On the Basement and Apparatus levels, outlet boxes shall be surface mounted.

Install all boxes level, with sides perpendicular to the floor.

Coordinate exact locations of floor boxes and poke-thru fittings with architectural drawings and approved furniture layouts.

Install floor boxes parallel and perpendicular to walls and flush with finished floor.

Install knockout closures to cap unused knockout holes, or where conduits have been removed.

Install appropriate covers on all boxes and fittings.

Install electrical boxes in locations which ensure ready accessibility to enclosed electrical wiring.

Fasten electrical boxes firmly and rigidly to substrates or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry.

Provide electrical connections for installed boxes.

Subsequent to installation of boxes, protect boxes from construction debris and damage.

Pull and junction boxes must be accessible, and not blocked by either the building structure or finish, or by piping or ductwork. Where necessary, provide access panels or doors. The locations and construction of any access panels must receive prior approval from the Architect.

GROUNDING:

Upon completion of installation work, properly ground electrical boxes and demonstrate compliance with requirements.

END OF SECTION 260534

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of panelboard work is indicated by drawings and schedules, and as herein specified.

Types of panelboards specified in this section include the following:

- Circuit breaker panelboards for lighting and appliance branch circuits
- Fusible switch panelboard for main distribution

Raceways and wires/cables related to the installation of panelboards are specified in other Division 26 sections.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of panelboards and accessories of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing panelboards similar to those required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction and installation of panelboards and accessories. Provide panelboards and components which are approved for installation in New York City.

UL Compliance: Comply with applicable requirements of UL Standards No.67 "Electric Panelboards", No.489 "Molded Case Circuit Breakers", and Nos.50, 869, 486A, and 1053 pertaining to panelboards, accessories, and enclosures. Provide panelboards which are listed and labeled by UL or ETL.

NEMA Compliance: Comply with applicable requirements of NEMA Standard No.'s 250 "Enclosures for Electrical Equipment (1000 Volts Maximum)", PB-1 "Panelboards", PB-1.1 "Instructions for Safe Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less", and PB-1.2 Application Guide for Ground-Fault Protective Devices for Equipment".

SUBMITTALS:

Product Data: Submit manufacturer's data on panelboards and accessories, including ratings, dimensions, application data, and construction details.

Panel Schedules: Submit manufacturer's panel schedule for each panelboard.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS: Subject to compliance with requirements, provide panelboards manufactured by one of the following:

General Electric Co.
Siemens Energy & Automation
Cutler-Hammer
Square D Company

GENERAL:

Provide commercial-grade enclosed dead-front panelboards and ancillary components of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design, and construction in accordance with published product information. Equip panelboards with switching and protective devices in the quantities, types, ratings, and arrangements indicated. Where types, sizes, or ratings are not indicated, comply with NYCEC, UL, and recognized industry standards for the applications indicated.

Residential-grade loadcenter construction will not be acceptable.

Where "Space" is indicated on the Panel Schedules, it shall be fully equipped for the future installation of the indicated device, with a blank cover over any exposed live parts.

BUS BARS:

Provide panelboards with copper bus bars, sized in accordance with NYCEC, NEMA and UL Standards. Provide full-sized neutral bus bars, with suitable lugs, as indicated. Provide an equipment ground bus, with suitable lugs, in each panelboard. Provide bus bars with sub-feed or through-feed lugs where so indicated or required.

Arrange for top or bottom mains entry as indicated or to suit installation conditions.

PANELBOARD ENCLOSURES:

Provide galvanized sheet steel cabinet type enclosures, sizes as required, code-gage, minimum 20 inches wide. Construct with top, bottom, and side wiring gutters sized per standards.

Provide fronts for lighting and appliance panelboards with concealed adjustable trim clamps, hinged door-in-door type, with one door over the interior and one over the wiring gutters. Provide doors with concealed piano hinges and brass locks for #47 keys. Equip with interior circuit directory frame and card, with clear plastic covering. Provide with baked gray enamel finish over rust inhibitor coating.

Provide enclosures for flush or surface mounting as indicated or to suit field conditions.

MOLDED-CASE CIRCUIT BREAKERS:

Provide factory-assembled thermal-magnetic molded-case circuit breakers of frame size, characteristics, and trip ratings indicated. Breakers shall be constructed with over-center, trip-free, toggle-type operating mechanisms, with quick-make quick-break action and positive handle trip indication.

Breakers shall be suitable for operating in an ambient temperature of 40°C.

Provide with screw-type AL/CU connector lugs.

Breaker mounting shall be bolt-on.

Where applicable, breakers shall be rated and labeled for switching duty (SWD) and/or HACR duty.

FUSIBLE SWITCHES:

Provide factory-assembled, quick-make, quick-break, three-pole switches, ratings as indicated, complete with Class R or Class J fuse clips. Each switch shall be assembled with its own individual hinged door and door interlock safety mechanism.

Provide each switch with three (3) Class RK5 or Class J fuses of the indicated ratings.

SHORT-CIRCUIT RATINGS:

Provide panelboard bus bracing and devices of the indicated short-circuit ratings, and so label each panel.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which panelboards and enclosures are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF PANELBOARDS:

Install panelboards and enclosures as indicated, in accordance with manufacturer's instructions, in compliance with applicable requirements of NYCEC, NEMA, and UL, and in accordance with recognized industry practices.

Coordinate installation of panelboards with cable and raceway installation work.

Unless otherwise noted, shown, or required by panel height, panelboards shall be mounted 6'-3" above finished floor to top of enclosure. Panelboard sides shall be perpendicular to the floor. Anchor enclosures firmly to walls and structural surfaces, ensuring that they are permanently mechanically secure.

Doors and trims shall be free from scratches and warping.

Provide properly wired electrical connections. Conductors shall be neatly trained and bundled.

Tighten connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals in accordance with UL Std. 486A.

Tag each breaker or switch neatly and accurately with its circuit number or load description.

Fill out each panelboard's circuit directory card upon completion of installation work. Directories shall be typewritten, and shall indicate applicable room and equipment descriptions.

Each panelboard shall be provided with an engraved laminated plastic nameplate indicating the system voltage and the panelboard identification number as shown on the Drawings.

FIELD QUALITY CONTROL:

Touch up scratched or marred surfaces to match original finishes. Adjust doors and trims for proper fit and operation.

Prior to energization, check all accessible connections to torque tightening specifications.

Prior to energization, test phase-to-phase and phase-to-ground insulation resistance with a 1000 VDC megger. Repair and re-test as required. Check for electrical continuity of circuits.

DEMONSTRATION:

Subsequent to wiring connections and quality control testing, energize panelboards and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units and then re-test to demonstrate compliance.

END OF SECTION 262416

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SECTION 262726

WIRING DEVICES

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of wiring device work is indicated by drawings and schedules, and as herein specified.

Types of wiring devices specified in this section include the following:

- Receptacles
- Ground-fault circuit interrupters
- Lighting switches and controls (wallbox type)
- Wallplates

Special devices such as motion sensing switches are specified on the Drawings and are work of this Section.

Raceways and wires/cables related to the installation of wiring devices are specified in other Division 26 sections.

Outlet boxes for wiring devices are specified in Division 26 section "Electrical Boxes and Fittings".

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of wiring devices and accessories of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing wiring devices similar to those required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction and installation of wiring devices and accessories.

UL Compliance: Provide wiring devices and accessories which are listed and labeled by UL or ETL.

NEMA Compliance: Comply with applicable requirements of NEMA Standard No.'s WD 1 "General Purpose Wiring Devices" and WD 5 "Specific Purpose Wiring Devices".

SUBMITTALS:

Product Data: Submit manufacturer's data on wiring devices and accessories, including ratings, application data, colors, finishes, and construction details.

Samples: If requested by the Architect, submit samples of proposed devices and accessories for approval.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS: Subject to compliance with requirements, provide wiring devices manufactured by one of the following:

Eagle Electric
Hubbell
Leviton
Arrow-Hart

GENERAL:

Provide wiring devices and ancillary components of types, sizes, and ratings indicated, and which comply with manufacturer's standard materials, design, and construction in accordance with published product information.

Unless otherwise specified, all receptacles and switches shall be manufacturers' specification grade.

RECEPTACLES:

Unless otherwise indicated or directed, general-purpose receptacles shall be NEMA 5-20R configuration, duplex, brown color.

Receptacles shall be grounding type with molded nylon body and face, and shall meet Federal Specification W-C-596F.

Where so indicated, receptacles shall be 5mA ground-fault-circuit-interrupting (GFCI) type with integral test and reset buttons.

SWITCHES:

Unless otherwise indicated or directed, lighting switches shall be 120 volt, 20 ampere, quiet-operating, self-grounding, toggle type, brown color.

Switches shall meet Federal Specification W-S-896E.

Provide single-pole, two-pole, three-way, or four-way switches as indicated or to suit the application.

WALLPLATES:

Provide a compatible wallplate for each wiring device or group of ganged devices.

Unless otherwise indicated or directed, wallplates shall be constructed of Type 302/304 stainless steel with satin finish.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which wiring devices and accessories are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF WIRING DEVICES:

Install wiring devices and accessories as indicated, in accordance with manufacturer's instructions, in compliance with applicable requirements of NYCEC, NEMA, and UL, and in accordance with recognized industry practices.

Coordinate installation of wiring devices with outlet box, cable, and raceway installation work. Install wiring devices only after wiring work is completed.

Install wiring devices in suitably sized and configured outlet boxes. Use multi-gang boxes and wallplates for adjacent devices of the same voltage class. Outlet boxes shall be clean and free from dirt and debris.

Protect devices from dirt, debris, and paint until completion of construction. Install wallplates only after painting work has been completed.

Install, connect, and adjust automatic motion sensing switches in strict accordance with manufacturer's instructions.

Tighten connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing

requirements are not indicated, tighten connectors and terminals in accordance with UL Std. 486A.

FIELD QUALITY CONTROL:

Upon completion of construction, replace all damaged devices and wallplates with new.

Verify correct voltage, polarity, and grounding of each receptacle.

Verify correct operation of each switch.

Adjust sensitivity and time delay of automatic motion sensing switches to suit the application and as directed by the architect.

END OF SECTION 262726

SECTION 262816

CIRCUIT AND MOTOR DISCONNECTS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of circuit and motor disconnect work is indicated by drawings and schedules, and as herein specified.

Applications for circuit and motor disconnects specified in this section include the following:

- Service and feeder disconnects
- Motor and equipment disconnects

Where applicable, circuit disconnects shall be listed and labeled for use as service entrance equipment.

Raceways and wires/cables related to the installation of safety switches are specified in other Division 26 sections.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of circuit and motor disconnects of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing circuit and motor disconnects similar to those required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction and installation of circuit and motor disconnects.

UL Compliance: Comply with requirements of UL 98 "Enclosed and Dead-Front Switches". Provide circuit and motor disconnects which are listed and labeled by UL or ETL.

NEMA Compliance: Comply with applicable requirements of NEMA Standard No.'s KS 1 "Enclosed Switches" and 250 "Enclosures for Electrical Equipment (1000 Volts Maximum)".

SUBMITTALS:

Product Data: Submit manufacturer's data on circuit and motor disconnects, including ratings, application data, enclosures, and construction details.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS: Subject to compliance with requirements, provide circuit and motor disconnects manufactured by one of the following:

Cutler-Hammer
General Electric Co.
Siemens
Square D Co.

GENERAL:

Provide circuit and motor disconnects and ancillary components of types, sizes, and ratings indicated, and which comply with manufacturer's standard materials, design, and construction in accordance with published product information.

SWITCHES:

Unless otherwise indicated or required, circuit and motor disconnects shall be 3-pole, 240VAC, steel-enclosed, NEMA Type HD, heavy-duty safety switches. Ampere ratings, number of poles, fusible or non-fusible construction shall be as indicated on the Drawings or required by Code for the application.

Switches shall have quick-make quick-break operating mechanism.

Operating handle shall have clearly recognizable position indicators, and shall be padlockable in the OFF position.

Where fusing is indicated or required, provide safety switches with Class J or Class R fuse clips and 200kAIC Class J or Class RK5 time-delay current-limiting fuses of specified or appropriate rating.

ENCLOSURES:

Provide painted sheet steel enclosures with hinged doors for safety switches – NEMA 1 indoors, NEMA 3R outdoors.

Doors shall be interlocked with the switch mechanism to prevent unauthorized opening while the switch is in the ON position or closing the switch while the door is open.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which safety switches are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF SAFETY SWITCHES:

Install safety switches as indicated, in accordance with manufacturer's instructions, in compliance with applicable requirements of NYCEC, NEMA, and UL, and in accordance with recognized industry practices.

Coordinate installation of safety switches with cable and raceway installation work.

Coordinate exact locations and mounting with equipment arrangements and field conditions. Switches must be readily visible and fully accessible.

Unless otherwise indicated or required, install switches 4'-6" above finished floor to centerline of handle. Provide supplemental steel supports as required.

Tighten connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals in accordance with UL Std. 486A.

Provide each switch with an engraved laminated plastic nameplate identifying the system voltage and the equipment controlled.

Install fuses where applicable.

FIELD QUALITY CONTROL:

Touch up scratched or marred surfaces to match original finishes. Adjust doors and mechanisms for proper fit and operation.

Energize circuitry and demonstrate compliance with requirements. Repair or replace malfunctioning units and re-test.

END OF SECTION 262816

SECTION 262900

MOTOR CONTROLLERS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of motor controller work is indicated by drawings and schedules.

Refer to other Division 26 sections for associated wire/cable work, raceways, motor circuit disconnects, and fuses.

All motors and motor-driven equipment are furnished and installed under other Divisions.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of motor controllers of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firms with at least 3 years of successful installation experience on projects with motor controller installation work similar to that required for project.

Code Compliance: Comply with requirements of the New York City Electrical Code as applicable to motor control equipment and components. Provide equipment and devices that are approved for installation in New York City.

UL Compliance: Comply with requirements of UL Std 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors". Provide controllers and ancillary equipment that are listed and labeled by UL or ETL.

NEMA Compliance: Comply with applicable requirements of NEMA Stds. Pub. Nos. ICS 2 and No. 250 pertaining to motor starters/controllers and their enclosures.

SUBMITTALS:

Product Data: Submit manufacturer's product data on motor controllers and accessories. Submit project-specific application data including, but not limited to, the following:

- Voltage, phases, and frequency
- Short-circuit ratings
- Circuit-breaker/fused switch ratings
- Types of motor starting
- Enclosures
- Motor size and overload heaters
- Control transformer sizes
- Control device types
- Auxiliary contacts

Wiring Diagrams: Submit project-specific wiring diagrams for motor controllers showing all connections. Clearly differentiate between portions of wiring that are manufacturer-installed and portions to be field-installed.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS: Subject to compliance with requirements, provide motor controllers and components manufactured by one of the following:

- Allen-Bradley Co.
- Cutler-Hammer
- General Electric Co.
- Siemens Energy and Automation, Inc.
- Square D Co.

MOTOR CONTROLLERS:

General: Provide motor controllers and ancillary components of types, sizes, ratings, classes and characteristics indicated; which comply with manufacturer's standard materials, design, components and construction in accordance with published product information, as required for complete installation, and as specified herein.

Magnetically-operated:

Motor starters shall be 3-pole, electrically-held, FVNR, unfused disconnect combination type. Provide with NEMA 1 enclosures for indoor applications and NEMA 4 enclosures for outdoor applications.

Each starter shall contain a 3-pole thermal overload relay with external reset. Provide three (3) overload heaters for each starter sized in accordance with manufacturer's instructions and actual motor nameplate full load amps and service factor.

Each starter shall be appropriately sized and rated for the motor served, minimum NEMA Size 0. Indicated horsepower are approximate; coordinate with the trade supplying the motors.

Unless otherwise indicated or required, all starter controls shall be 120VAC. Starters shall each be provided with a control power transformer fused on both primary and secondary sides, tapped from the line side of the contactor. The unfused secondary leg shall be grounded.

Each starter shall be provided with minimum 3-normally open and 1-normally closed auxiliary contacts, cover-mounted hand-off-auto selector switch, and RUN pilot light. Refer to approved control diagrams for other requirements and modify starters to suit. Pilot lights shall utilize long-life, 20,000 hour minimum lamps.

Manual Motor Starting Switches:

Manual motor starters shall be toggle-type 1-pole, 2-pole, or 3-pole as required to suit the application and rated for the actual connected motor horsepower. The switch shall be padlockable in the OFF position.

Provide starters with a thermal overload device in each phase leg sized and rated per NYCEC and manufacturer's instructions for the actual motor nameplate full load amps.

Provide starters with NEMA 1 enclosures for indoor applications and NEMA 4 enclosures for outdoor applications.

Provide each manual motor starter with an integral RUN pilot light.

Equipment/System Identification:

Provide each motor controller with an engraved laminated plastic nameplate identifying the system voltage and the equipment controlled.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which motor controllers and accessories are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF MOTOR CONTROLLERS:

Install motor controllers and accessories as indicated, in accordance with manufacturer's written instructions, and with recognized industry practices; complying with applicable requirements of NYCEC, UL, and NEMA standards to ensure that products fulfill requirements.

Coordinate with other electrical work including wiring/cabling and raceway work, as necessary to interface installation of motor controllers with other work.

Install overload heaters and fuses, if any, in motor control units.

Install and connect field control wiring for remote start-stop and status indication as shown on Electrical Drawings or as required to suit the application.

Coordinate exact locations of controllers with equipment arrangements and field conditions. Final installation must leave controllers readily visible and fully accessible. Install controllers within sight of the driven equipment unless otherwise indicated.

Controllers shall be mounted 4'-6" above finished floor to centerline of operating handle unless otherwise indicated or required. Where necessary, provide supplemental steel supports anchored to floor, wall, equipment frame, or equipment concrete pad.

Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A.

ADJUSTING AND CLEANING:

Adjust operating mechanisms for free mechanical movement.

Touch-up scratched or marred surfaces to match original finishes.

Where applicable, adjust overload relay settings to the minimum point at which the motors will start and run continuously.

GROUNDING:

Provide equipment grounding connections for motor controllers as indicated or required.

FIELD QUALITY CONTROL:

Prior to energization of motors and motor controllers, check with insulation resistance tester for proper values of phase-to-phase and phase-to-ground insulation resistance.

Prior to energization of circuitry, check electrical circuits for continuity and for short circuits.

Subsequent to wire/cable and raceway hook-ups, energize motor controller circuitry, check each motor for proper phase rotation and control, and demonstrate capability and compliance with requirements. Correct malfunctioning units, then retest to demonstrate compliance.

END OF SECTION 262900

SECTION 263213

STANDBY POWER GENERATOR

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

1.2 SUMMARY

This specification describes requirements for a packaged generator for standby power to be installed at the subject project site. The generator shall automatically start and assume full connected load within 10 seconds of its receipt of the remote start signal. Sensing and transfer controls, circuit breakers, and other related equipment and accessories are specified in other Division 26 sections.

The work of this section generally consists of the furnishing, delivery, testing, and startup of a 175 KW/218 KVA, 208/120 VAC, 3 phase, 4 wire, diesel-driven generator set including, but not necessarily limited to, diesel engine, electric generator, engine starting system with batteries and charger, instrument control panel, weather-protective sound-attenuating housing, fuel storage day tank with automatic duplex transfer pumps, remote annunciator panel, exhaust silencer, and accessories.

It is the intent of this specification and the associated contract drawings to secure the provision of all materials, labor, equipment, and services necessary to furnish, deliver, install, connect, test, and leave ready for operation all work indicated.

The equipment shall be fully compatible with electrical, environmental, and space conditions at the site. The system shall include all equipment to properly interface the standby power source to the intended loads and shall be designed for unattended automatic operation.

1.3 STANDARDS

The generator set and all associated equipment shall be designed and manufactured in accordance with the following applicable standards:

- NEMA MG 1, Motors and Generators
- NEMA MG 2, Safety Standards for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators
- NFPA 37, Stationary Combustion Engines and Gas Turbines
- NFPA 110, Emergency and Standby Power Systems
- New York City Electrical Code (NYCEC)

Wherever applicable, generator set components and accessories shall be UL listed and labeled for their specific application.

1.4 RELATED WORK

Concrete pad and foundation for the installation of the generator set equipment will be provided under another Division of these specifications.

Refer to Section 263623 of these Specifications for requirements for related automatic transfer control equipment.

1.5 SUBMITTALS

Submittals for Engineer's review and acceptance shall include:

- Complete technical descriptions and specifications of equipment and accessories to be furnished, including a specific listing of deviations from these specifications if any.
- Dimensioned layout of the generator set enclosure showing all major components and accessories.
- Size and weight of shipping units to be handled by the installing contractor.
- Functional relationship of equipment including weights, dimensions, and heat dissipation.
- Material Safety Data Sheets (MSDS) where applicable.
- Engine exhaust emissions compliance statement.
- Warranty information.
- Detailed installation drawings, including all terminal and connection locations.
- Interconnect wiring diagrams showing terminal numbers for each wire.

Record submittals shall include:

- A complete set of as-built submittal drawings, including any modifications or corrections incorporated during review, manufacturing, and factory testing.
- Certified factory test reports.
- Three (3) sets of instruction manuals. Manuals shall include a functional description of the equipment, safety precautions, instructions, step-by-step operating procedures and routine maintenance guidelines, including illustrations. The manuals shall include outline, interconnection, wiring, and control drawings accurately describing the equipment provided. Provide ladder logic for all programmable logic controllers in the system.

1.6 PRODUCT OPTIONS AND SUBSTITUTIONS

Provide products that are compatible with each other, with other connected items, and with existing conditions.

Where substitutions are proposed for specified equipment, or where selection is left to the Contractor or Vendor, the Contractor shall be responsible for coordinating the equipment size, characteristics, and ratings with the associated equipment and conditions.

1.7 NAMEPLATE DATA

Each item of power operated equipment shall be provided with a permanent data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.

Nameplates shall be located in an accessible location.

1.8 DELIVERY, STORAGE, AND HANDLING

Deliver equipment and products to the project site properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications, and adequately packaged and protected to prevent damage during shipment, storage, and handling.

Coordinate deliveries of materials and equipment to minimize jobsite congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.9 WARRANTIES

The generator set manufacturer shall warrant the unit against defects in workmanship and materials for 12 months after initial start-up or 18 months after ship date, whichever comes first. This warranty shall include the costs for parts and labor.

1.10 QUALITY ASSURANCE

Factory Testing: Before shipment, the manufacturer shall fully and completely test the system in accordance with standards to ensure compliance with the specification. Submit certified test reports for Owner's record.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

The supplier shall be the manufacturer's authorized distributor for the project site region, who shall provide initial start-up services, conduct field acceptance testing, and warranty

service. The supplier shall have 24-hour service availability and factory-trained service technicians authorized to perform warranty service on all products provided.

Subject to compliance with requirements, manufacturers offering engine generator sets which may be incorporated in the work are the following:

- Cummins
- Caterpillar
- Generac

2.2 DIESEL GENERATOR SETS

Provide manufacturer's standard diesel engine-driven generator set and auxiliary equipment as indicated by published product information and as required for a complete installation. The generator set and accessories shall be factory-installed and tested in the specified housing, and shipped as a complete unit requiring minimum field erection and assembly.

The generator set shall be nominally rated as indicated. The KW rating shall be at 0.8 power factor, 40° C ambient temperature, for continuous standby operation for the duration of any utility power outage.

Voltage regulation shall be +/- 1.0 percent for any constant load between no load and rated load.

Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.

The diesel engine-generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.

Motor starting capability shall be a minimum of 763 kVA. The generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set.

2.3 ENGINE

The engine shall be a 4-cycle, 1800 RPM, water-cooled compression ignition diesel. Specific engine size and performance selections shall be provided by the manufacturer to satisfy system performance requirements.

The engine shall be EPA Tier 3, 40 CFR 89 certified.

The engine shall be equipped with the following components:

- Positive displacement, mechanical, full pressure, lubrication oil pump.
- Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.
- An engine driven, mechanical, positive displacement fuel pump.
- Fuel filter with replaceable spin-on canister element.
- Replaceable dry element air cleaner with restriction indicator.
- Engine mounted battery charging alternator with solid-state voltage regulator.

Provide a crankcase emission control system that shall remove a minimum of 99% of crankcase emissions. The crankcase emission control system shall reduce Nox, hydrocarbon and oil from the crankcase emissions.

The engine governor shall be isochronous electronic type.

The unit shall be mounted on a structural steel sub-base and shall be provided with adjustable spring-type vibration isolators and suitable seismic restraints.

Safety shut-offs for high water temperature, low oil pressure, overspeed, low coolant level, and engine overcrank shall be provided.

Unit mounted thermal circulation type jacket water heaters with automatic thermostat control shall be furnished to maintain engine jacket water at 90° F in an ambient temperature of 0° F. Heaters shall be rated for 208 volt, 1 phase input.

An engine-mounted radiator with duct flange and blower type fan shall be sized to maintain rated operation at 50°C maximum outside air temperature. Coolant system shall be filled by the vendor with a 50/50 ethylene glycol/water mixture.

All moving parts shall be guarded in compliance with OSHA requirements.

2.4 FUEL SYSTEM

Provide a skid-mounted or sub-base UL listed double-wall fuel oil day tank appropriately sized for the engine (minimum 3 hour full load capacity). The fuel tank shall be constructed of heavy-gauge corrosion-resistant steel. Provide tank with fuel level gauge and alarms for low fuel level and leak detection.

Provide day tank with an automatic duplex transfer pump system, minimum 2GPM, designed to operate at 120VAC.

The equipment, as installed, shall meet all local and regional requirements for above ground tanks. Tank shall meet all New York City codes.

Fuel piping from the day tank to the engine shall be provided under this Section, sized in accordance with manufacturer's specifications. Final connections to the engine shall be flexible.

Fuel piping from the main storage tank to the day tank will be furnished and installed under another Division.

2.5 EXHAUST SYSTEM

Exhaust silencer shall be provided for the engine, size and type as recommended by the generator set manufacturer. The silencer shall be super critical grade. Exhaust system shall be installed prior to shipment by the manufacturer. The silencer and piping shall be of high temperature and corrosion-resistant construction. Final connection to the engine manifold shall be flexible stainless steel for vibration isolation.

Silencer shall be installed inside the housing. Silencers mounted on the enclosure roof are NOT acceptable.

Provide a suitably configured exhaust outlet and, if required, a rain cap.

2.6 STARTING SYSTEM

Provide engine-generator unit with a 12 or 24-volt DC electric starting motor with positive engagement drive. The starting motor shall be capable of three complete cranking cycles without overheating.

A lead-acid storage battery set of the heavy-duty diesel starting type shall be provided. The battery set shall be of sufficient capacity to provide minimum 1-1/2 minutes total cranking time without recharging. A corrosion-resistant battery rack and necessary cables and clamps shall be provided.

A current-limiting battery charger shall be furnished to automatically recharge batteries and to maintain at full charge. It shall include overload protection, voltage surge suppressors, DC voltmeter, DC ammeter, and fused AC input. AC input voltage shall be 120 volts. Amperage output shall be no less than 10 amperes.

2.7 GENERATOR

The AC generator shall be synchronous, four pole, 2/3 pitch, revolving field, dripproof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system. Actual temperature rise measured by resistance method at full load shall not exceed 105 degrees Centigrade.

The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

AC generator shall be a 12 lead reconnectable at three phase voltages while still providing the full output rating of the generator.

A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase fault at approximately 300% of rated current for not more than 10 seconds.

The subtransient reactance of the alternator shall not exceed 13 percent based on the standby rating of the generator set.

Provide a generator output main circuit breaker, set-mounted and wired, UL listed, molded case type with electronic trip unit, rated at 600 amps, 3 pole, 600 volts. Submittals shall demonstrate that the circuit breaker provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Load side terminals, including full-rated neutral, shall be arranged for bottom cable exit.

2.8 GENERATOR CONTROL PANEL

A microprocessor-based, generator-mounted, vibration isolated, dead front, UL 508 listed control panel shall be provided. Panel construction shall be single-membrane with a gasketed enclosure. The control panel shall contain, but not be limited to, the following features and functions:

- Digital AC output metering, RMS sensing (volts, amps, frequency, KW)
- Automatic starting and cranking controls with Run-Off-Auto selector switch
- Emergency stop switch, with provisions for field connection of a remote emergency stop switch
- Panel illumination lights and switch
- Voltage level adjustment
- Comprehensive microprocessor-based generator output load, voltage, and frequency monitoring and controls including overload warning indication
- Fault history and data logging
- Engine oil pressure
- Engine oil temperature
- Engine water temperature
- DC battery volts
- Elapsed run time meter
- Alarm indications and shutdowns per NFPA 110, Level 1
- Alarm horn with silencing pushbutton and light
- Alarm lamp test switch

Control panel shall also contain a factory-wired alarm to indicate fuel tank leak or rupture, with provisions for connection to the remote annunciator.

The generator set shall include an automatic voltage regulation system which is matched and prototype tested with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below a threshold of [58-59] HZ.

The control panel shall include provisions for field connection to the remote annunciator.

2.9 REMOTE ANNUNCIATOR

Provide a 20-light LED type remote alarm annunciator, with horn, in a surface-mounted NEMA 1 enclosure located as shown on the drawings. The remote annunciator shall provide all the audible and visual alarms specified by NFPA Standard 110 for Level 1 systems, and in addition shall provide indications for high battery voltage, low battery voltage, and loss of normal power to the charger. Spare lamps shall be provided to allow future addition of other alarm and status functions to the annunciator. Provisions for labeling of the annunciator in a fashion consistent with the specified functions shall be provided. Alarm silence and lamp test switches shall be provided. LED lamps shall be replaceable, and indicating lamp color shall be capable of changes needed for specific application requirements. Alarm horn shall be switchable for all annunciation points. Alarm horn shall sound for first fault and all subsequent faults, regardless of whether first fault has been cleared, in compliance with NFPA 110.

The annunciator shall also be provided with an integral or adjacent emergency stop pushbutton or switch, with a protective cover to prevent accidental operation.

2.10 GENERATOR SET HOUSING

Provide a compatible sound-attenuated, weatherproof housing for the generator set and accessories. The housing shall be factory-assembled and shipped complete with the generator set and accessories installed. All installed equipment and components shall have code-required and manufacturer-recommended working clearances and access. Fuel tank fill, engine oil drain, and coolant drain pipes shall be extended to an accessible location at the exterior of the enclosure.

The housing shall be designed and constructed to limit source noise to maximum 77.5 dBA at 7 meters in any direction.

Structural rigidity, wind, snow, and seismic loads shall be certified as suitable for the location at which installed.

Exterior wall panels shall be factory treated and painted to provide a durable corrosion and weather-resistant finish using an E-Coat or equivalent paint process. Finish shall be the manufacturer's standard color. Steel base and framing shall be primed and painted with two coats of epoxy paint.

All hardware and fasteners shall be corrosion-resistant. All doors shall be lockable.

Provide steel base with suitable welded lifting lugs for balanced lifting of the housing.

PART 3 – EXECUTION

3.1 EXAMINATION:

Examine areas and conditions under which standby generator set and accessories are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

Install and connect standby generator set and accessories as indicated and in strict accordance with manufacturer's written instructions, in compliance with applicable requirements of NYCEC, NEMA, and UL, and in accordance with recognized industry practices.

3.3 FIELD QUALITY CONTROL

The following inspections and test procedures shall be performed by factory-trained field service personnel prior to the initial generator set start-up:

Visual Inspection:

- Inspect equipment for signs of damage.
- Verify installation per drawings and manufacturer's instructions.
- Inspect for foreign objects.

Mechanical Inspection:

- Check all mounting, piping, and wiring connections for tightness.
- Verify proper lube oil and coolant levels.
- Verify that all filters are in place.

Electrical Inspection:

- Confirm output voltage and phasing are correct.
- Assure connection, polarity, and voltage of the starting system.

- Verify neutral and ground conductors are properly sized and configured.

3.4 UNIT START-UP

Initial start-up, adjustments, and testing procedures for the new equipment shall be performed by manufacturer's factory-trained field service personnel in strict accordance with the manufacturer's recommended procedures. An air-cooled load bank and temporary cables equal to the generator's rated kW output shall be provided by the contractor.

- Perform a 4-hour load bank test at 100% rated kW output; monitor and record coolant temperature, oil pressure, ambient temperature, and electrical parameters every 15 minutes.
- Measure and record no-load to full-load voltage and frequency regulation.
- Measure and record one-step load application response.
- Verify operation of safety shutdowns.
- Verify correct operation of damper operators and controls, if applicable.
- Verify correct operation of the remote annunciator panel and emergency stop switch.

3.5 SYSTEM TESTING

Unit startup and testing shall be successfully completed before performing system tests.

Perform system testing and commissioning under the direction of manufacturers' factory-trained field service personnel for both the generator set and the associated automatic transfer switch:

- Simulate utility outage; verify automatic generator start.
- Verify operation of automatic transfer switch to Emergency position within 10 seconds or less.
- Simulate utility return; verify re-transfer operations, generator cool-down, and shutdown.
- Perform other procedures as may be recommended by the generator or transfer switch field service personnel.

Provide certified startup and field test reports to the Owner for record.

3.6 TRAINING

Demonstrate operating and safety procedures to Owner's personnel and provide written operating instructions with full explanation of all technical information.

END OF SECTION 263213

SECTION 263623

AUTOMATIC TRANSFER SWITCH

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

This technical specification is supplemental to, and shall form a part of, the Owner's General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof and to the other sections of Division 26.

1.2 DESCRIPTION OF WORK

Extent of automatic transfer switch work and the ratings of transfer equipment are shown on the Drawings and specified herein.

Standby generator, raceways, and wires/cables related to the installation of automatic transfer switches are specified in other Division 26 sections.

1.3 SUBMITTALS

Product Data: Submit manufacturer's complete product specification and application data, dimensions, connection locations, installed features and devices specific to this project, materials lists, and ratings.

Shop Drawings: Submit project-specific wiring diagrams for the transfer switch, clearly differentiating between manufacturer-installed and field-installed wiring.

Operation and Maintenance Data: Submit operating and maintenance data, including all features and operating sequences, both automatic and manual. List all factory settings of relays and timers, and provide relay and timer setting and calibration instructions. Provide recommended spare parts list.

1.4 QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of automatic transfer switches, components, and accessories of types, sizes, and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing automatic transfer switches similar to those required for this project.

NYCEC Compliance: Comply with applicable requirements of the New York City Electrical Code regarding the installation and wiring of transfer switches and accessories.

NFPA Compliance: Comply with Standard 110, "Standard for Emergency and Standby Power Systems."

NEMA Compliance: Comply with NEMA Standards ICS 10 "Electromechanical AC Automatic Transfer Equipment"; ICS 2 "Industrial Control Devices, Controllers and Assemblies"; and ICS 6 "Enclosures for Industrial Controls and Systems."

UL Compliance: Comply with UL Standard 1008, "Automatic Transfer Switches," except where requirements of these specifications are stricter. Provide products that are listed and labeled by UL or ETL.

The complete ATS shall be factory tested prior to shipment to ensure proper operation of each component and control circuit in compliance with standards and specifications. A certified test report shall be submitted to the Owner for record.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Subject to compliance with requirements, provide transfer switch products manufactured by one of the following:

- Automatic Switch Co. (ASCO)
- Russelectric
- Same manufacturer as the supplied standby generator package (reference Section 263213)

2.2 TRANSFER SWITCH PRODUCTS, GENERAL

Ratings: Provide number of poles and current and voltage ratings as indicated. Current ratings shall be compatible with the classes of loads to be served. Provide equipment with a minimum fault-withstand rating of 100,000 RMS symmetrical amperes when used with the indicated upstream circuit protective devices.

Enclosures: General-purpose NEMA 1 in accordance with UL 508, "Electric Industrial Control Equipment".

Factory Wiring: Train and bundle factory wiring, and identify consistently with shop drawings either by color code or by numbered or lettered wire and cable tape markers at all terminations. Provide labeled terminal blocks for field wiring.

Electrical operation shall be accomplished by a non-fused momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

Transfer switches using components of molded case circuit breakers, or contactors not designed for continuous duty repetitive switching between active power sources, are not acceptable.

Switch action for double-throw switches shall be mechanically held in both directions, incapable of pauses or intermediate position stops during normal functioning. Overcurrent devices shall not be part of transfer switch products.

A manual operator shall permit transferring the switch to either source position for maintenance purposes. Control circuit shall be disconnected from electrical operator during such manual operation.

2.3 AUTOMATIC TRANSFER SWITCH (ATS)

Comply with requirements for Level 1 equipment per NFPA 110, "Standard for Emergency and Standby Power Systems."

Operation of the automatic transfer switch shall be directed by a microprocessor controller.

Provide ATS with the following controls and accessories:

- Close-differential voltage sensing on each phase of normal source. Pick-up voltage shall be adjustable to 95 percent of nominal, and dropout shall be adjustable from 70 percent to 90 percent of the pick up value. Factory set for pick-up at 95 percent and dropout at 85 percent.
- Time-delay override of normal source voltage sensing shall intentionally delay all engine start and transfer signals - adjustable 0 to 6 seconds, factory set at 2 seconds.
- Voltage/frequency sensing of one phase of the emergency source and lockout controls shall be provided to prevent premature transfer to the standby source. Voltage pick-up shall be adjustable from 85 to 95 percent of nominal; factory set at 90 percent. Pick-up frequency shall be adjustable from 90 percent to 100 percent of nominal; factory set at 95 percent. Provide adjustable time delay for transfer to emergency, 0 to 300 seconds, factory set at 0 seconds, to permit staggered transfer of multiple switches. A generator stabilization time delay shall be provided after transfer to emergency.
- System test switch to simulate a normal source failure.

- Time delay for retransfer to normal source, adjustable from 0 to 30 minutes and factory set at 15 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.
- Pilot lights to indicate source to which the load is connected and the availability of each source.
- Engine starting contacts, one isolated normally closed and one isolated normally open. Contacts shall be gold flashed or plated and rated 5 amperes at 32 VDC. The start signal shall prevent dry cranking by requiring the generator to reach proper output and run for duration of the cooldown period regardless if normal source restores before load transfer.
- Five minute engine cooldown timer
- Unassigned Auxiliary Contacts: Two normally open contacts for each switch position, rated 10 amperes at 250 VAC.
- Transfer Time Delay Override Switch: To manually bypass automatic transfer or retransfer time delays.
- Engine exercising timer, user programmable, selectable with or without load transfer.
- In-phase monitor to control transfer between 2 live sources.

PART 3 EXECUTION

3.1 EXAMINATION

Examine areas and conditions under which transfer switches and accessories are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

Install transfer switches as indicated, in strict accordance with the equipment manufacturer's written instructions, and with recognized industry practices, to ensure that units fulfill requirements.

Comply with NYCEC, NFPA, UL, and NEMA standards pertaining to installation of transfer switches and accessories.

Coordinate with other work, including raceway, wire/cable, panelboards, etc. as necessary to interface installation of transfer switches with other work. Coordinate all necessary power

and control interconnections with the associated generator system and distribution switchboards.

3.3 CONNECTIONS

Install normal, emergency, and load power cable connections to maintain A-B-C phase rotation.

Check connectors, terminals, bus joints, and mountings for tightness. Tighten field connected

connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque listening values. Where manufacturer's torquing requirements

are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

3.4 GROUNDING

Provide equipment grounding connections for transfer switch units as indicated, and as required by

NYCEC. Tighten connectors to comply with tightening torques specified in UL Standard 486A to

assure permanent and effective grounding.

3.5 FIELD QUALITY CONTROL

Preliminary Tests:

- Measure, with insulation resistance tester, phase-to-phase and phase-to-ground insulation resistance levels to assure requirements are fulfilled. Disconnect control circuits for this test to prevent damage.
- Check for electrical continuity of circuits, and for the absence of short circuits.

Manufacturers Field Services: Provide the services of a factory-authorized service representative to assist with final connections, adjustments, demonstrations, and field tests.

Field Tests:

ATS tests shall be coordinated with tests of generator plant, and run concurrently with them. Tests shall include the following:

- Energize transfer switches and demonstrate functioning of all devices, components, and sequences.

- Verify identical phasing of normal and emergency sources.
- Simulate power failure of normal source.
- Simulate power failure of emergency source with normal source available.
- Check and adjust all adjustable time delays.

Test Failures: Correct deficiencies identified by tests and retest. Verify equipment meets the specified requirements.

Reports: Maintain a written record of observations and tests. Report defective materials and workmanship. Submit written test reports. Include a record of all adjustable relay settings and measured time delays.

END OF SECTION 263623

SECTION 265000

LIGHTING

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the other sections of Division 26.

DESCRIPTION OF WORK:

Extent of lighting work is indicated by drawings and schedules, and as herein specified.

Raceways, boxes and fittings, and wires/cables related to the installation of lighting fixtures and equipment are specified in other Division 26 sections.

The connection of wire/cable conductors is specified in Division 16 section "Electrical Connections".

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of lighting fixtures and accessories of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing lighting fixtures and accessories similar to those required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction and installation of lighting fixtures and accessories. Provide lighting fixtures and accessories that are approved for installation in New York City.

UL Compliance: Provide lighting fixtures and accessories that are listed and labeled by UL or ETL.

SUBMITTALS:

Product Data: Submit manufacturer's data on lighting fixtures and accessories, including dimensions, application data, construction details, finishes, photometric data, ballasts, transformers, lamps, and mounting accessories.

Submittals shall clearly identify each fixture by type in accordance with the Lighting Fixture Schedule.

PART 2 - PRODUCTS

GENERAL:

Provide lighting fixtures of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design, and construction in accordance with published product information. Provide fixtures complete with housing, lenses, louvers, baffles, lamps, lampholders, reflectors, ballasts, transformers, starters, wiring, and mounting accessories.

Fixture types are indicated on schedules and drawings. Fixtures must comply with minimum requirements as stated therein or listed in the manufacturers' published data.

Review Architectural drawings and specifications to verify mounting arrangements, ceiling types, modules, and suspension systems as applicable to lighting fixture installation. Provide fixtures and accessories that are fully compatible with the mounting location and arrangement.

BALLASTS:

All ballasts shall be UL or ETL listed, and shall be compatible with the fixtures, lamps, and voltage systems specified. Where applicable, ballasts shall comply with Public Law 100-357 for energy efficiency, and with the requirements of FCC Part 18.

Fluorescent ballasts for rapid-start lamps shall be high power factor, thermally protected Class P, high frequency electronic type, sound rated A or better. Input total harmonic distortion (THD) shall be less than 15%. Ballasts shall withstand line transients as defined in ANSI/IEEE C62.41, Category A.

Ballasts for compact fluorescent lamps shall be high power factor (minimum 90%).

Ballasts for HID lamps shall be high power factor (minimum 90%), constant-wattage autotransformer type where available.

LAMPS:

Provide lamps for each fixture as indicated on drawings or schedules, or to suit the specified fixtures.

Linear fluorescent lamps shall be energy-saving T8 type.

All fluorescent lamps shall be by the same manufacturer and shall be of the same color temperature unless otherwise indicated or required. Lamps of the same wattage, size, and shape shall be identical.

HID lamps in enclosed fixtures shall be clear. HID lamps in open fixtures shall be diffuse-coated.

EXIT AND EMERGENCY LIGHTING:

Emergency lighting units shall utilize maintenance-free lead-calcium batteries sized for minimum 90 minutes illumination with the connected lamp wattage. Housings shall be heavy-gauge steel with baked enamel finish. Provide complete with suitable wall mounting bracket or shelf.

Exit signs shall be illuminated type utilizing low-energy LED lamps. Provide exit sign with integral 90 minute battery backup. Lettering shall be red color, minimum 6 inches high. Housings shall be heavy-gauge steel with baked enamel finish. Provide with mounting bracket and directional arrows to suit each application.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which lighting fixtures and accessories are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF LIGHTING FIXTURES:

Install lighting fixtures and accessories at the locations and heights indicated, in accordance with fixture manufacturers' written instructions, applicable requirements of NYCEC and UL standards, and recognized industry standards. Refer to Architectural Drawings for exact locations and mounting arrangements.

Coordinate the installation of lighting fixtures with other work to prevent subsequent damage.

Unless otherwise indicated, install all fixtures within a given area equally spaced, sides parallel to walls, and level.

Fixtures shall not be mounted above ducts, pipes, or equipment where rendered inaccessible or where the light output is substantially blocked.

Fixtures shall be supported from the building structure and not be supported from ductwork or piping.

Connect lighting fixtures to the indicated branch circuits, controls, and switches. Emergency lights, exit signs, and fixtures designated as night lights shall be connected to the assigned branch circuits without switching.

FIELD QUALITY CONTROL:

Touch up scratched or marred surfaces to match original finishes. Adjust fixture doors and trims for proper fit and operation.

Replace damaged lenses and louvers with new.

Replace all inoperative lamps, transformers, and ballasts.

Clean all fixtures of dirt, debris, and fingerprints.

DEMONSTRATION:

Subsequent to wiring connections, energize lighting fixtures and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, replace inoperative lamps and ballasts, and then re-test to demonstrate compliance.

END OF SECTION 265000

SECTION 270000

SIGNAL AND COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

RELATED DOCUMENTS:

This technical specification is supplemental to, and shall form a part of, the General Terms and Conditions as described in the Construction Contract for this work. All work shall be subject to the provisions thereof, and to the sections of Division 26.

DESCRIPTION OF WORK:

Extent of signal and communications systems work is indicated by drawings and schedules, and as herein specified.

Raceways, boxes and fittings, and wires/cables related to the installation of signal and communications equipment are specified in other Division 26 sections.

QUALITY ASSURANCE:

Manufacturers: Firms regularly engaged in manufacture of signal and communications equipment of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's Qualifications: Firm with at least 5 years of successful installation experience with projects utilizing signal and communications equipment and accessories similar to those required for this project.

Code Compliance: Comply with NYCEC requirements as applicable to construction and installation of signal and communications equipment and accessories. Provide equipment and accessories that are approved for installation in New York City.

UL Compliance: Where applicable, provide signal and communications equipment, devices, and accessories that are listed and labeled by UL or ETL.

FDNY Compliance: Provide products and installation that comply with applicable FDNY Design and Construction Standards.

SUBMITTALS:

Product Data: Submit manufacturer's data on signal and communications equipment, devices, and accessories, including dimensions, application data, ratings, construction details, and installation and connection details.

Connection Diagrams: Submit project-specific connection diagrams clearly indicating all equipment, devices, and accessories and specifying all interconnecting power, control, and signal wiring.

PART 2 - PRODUCTS

GENERAL:

Provide signal and communications equipment and components of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design, and construction in accordance with published product information.

All signal and communications systems equipment shall be in full compliance with FDNY standards and requirements.

TELEPHONE AND NETWORK SYSTEM:

Department phones will be furnished by the Owner. This Contractor shall provide all associated cabling, raceways, and jacks for the phone and network system as indicated on the Drawings.

CABLE TV:

Televisions, VCR's, DVD players, etc. will be provided by the owner. This Contractor shall provide associated cabling, raceways, and jacks for the cable TV system as indicated on the Drawings.

PART 3 - EXECUTION

EXAMINATION:

Examine areas and conditions under which signal and communications systems equipment and wiring are to be installed, and notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

INSTALLATION OF SIGNAL AND COMMUNICATIONS SYSTEMS:

Install signal and communications systems equipment and accessories at the locations indicated, in accordance with system manufacturers' written instructions, applicable requirements of NYCEC, FDNY, and UL standards, and recognized industry standards.

Coordinate the installation of signal and communications systems equipment and accessories with other work to prevent subsequent damage.

Install and connect input power feeders and branch circuit wiring in accordance with the Electrical Drawings and applicable sections of Division 26 specifications.

Install and connect signal and communications wiring in strict accordance with system manufacturer's instructions and diagrams and with the Electrical Drawings. Exact routing of raceways and cabling shall be field-determined by the Contractor.

TESTING AND DEMONSTRATION:

Prior to energizing each system, a complete inspection of the installation and connections shall be made. All wiring shall be tested for continuity and the absence of shorts.

Subsequent to the completion of all equipment installations and wiring connections, energize each system and demonstrate to the Architect and Owner all system functions in accordance with project requirements. Where necessary, repair or replace malfunctioning components or wiring and then re-test to demonstrate compliance.

END OF SECTION 270000

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SECTION 280000**SECURITY SYSTEMS****PART 1 - GENERAL****1.1 PROJECT SUMMARY**

These specifications describe the requirements, performance parameters, and operating considerations for the supply and installation of access control, video surveillance and narcotics cabinet security systems to be supplied and installed in New York City Fire Department (FDNY) Emergency Medical Services (EMS) Station at 159-10 Goethals Avenue, Jamaica, NY 11432.

The EMS station security equipment shall be monitored by an existing Software House C-Cure 800 access control/alarm monitoring system installed at FDNY Headquarters, 9 MetroTech, Brooklyn, NY. Any additional equipment required at the existing monitoring location shall be supplied and installed under a separate contract.

1.2 SECURITY SYSTEM DESCRIPTION

This section provides a general description of the security work to be performed. Specific requirements are described in following sections.

Biometric vascular access control readers shall be supplied and installed to control access at the front and rear doors of the EMS station, the Server Room, the ALS Room and at the narcotics cabinets in the ALS Room. Proximity smart card readers shall control electric locksets (supplied and installed by others) at other door locations.

Two narcotics cabinets/safes shall be supplied and installed in the ALS Room. Each safe shall have one door with a fail-secure electric deadbolt controlled by a Software House iStar field panel from input provided via two distinct biometric vascular readers. The control of the locks shall be determined at the field panel; the system shall not require communication to the host system to determine access validity.

The field panel shall communicate with the host access control system at FDNY Headquarters via the FDNY wide area network.

1.3 WORK INCLUDED

- A. Submission of shop drawings, samples, training manual, testing plan, and as-built drawings.
- B. Commissioning: Contractor shall use a portable computer with C-Cure 800 software to enter and download all initial database information including, but not limited to, employee data, alarm descriptors, extended alarm messages,

and report styles. Contractor shall submit to the Client suitable data entry forms within one week of bid award and shall instruct the Client on what data is required to complete the forms.

- C. Testing and debugging of all components, sub-systems, and systems. Contractor shall use a portable computer with C-Cure 800 software to demonstrate system operation to Owner/Owner's representative. Resolve all defective items until complete acceptance by the Client. (Beneficial use shall not be considered acceptance).
- D. Warrant and maintain system for one year from date of system acceptance.
- E. Supply and install all specified equipment and low voltage cable. Conduit shall be used for all security cable.
- F. Supply and install low voltage power transformers and power supplies for field panels and door locks. Install fire-resistant plywood backboard for narcotics safe, field panels and power supplies. Terminate all cable.
- G. Connect low voltage power supplies/transformers to line voltage AC power junction boxes. Main power electrical work shall be provided by under separate spec section.
- H. Connect cabling to electric locksets and electric exit devices installed by others.
- I. Interface/coordinate with general contractor and door hardware contractors, as required. Attend site coordination meetings.
- J. These specifications describe major components. It is the intent of this procurement that a complete working system be installed. Contractor shall furnish and install components and services as described plus all those necessary, e.g., connectors, jumpers, mounting hardware, etc., to achieve the intent.
- K. 120 VAC power circuits, outlets and boxes.
- L. Standard equipment back boxes, conduit stub-ups, and junction boxes.

1.4 WORK BY THE GENERAL CONTRACTOR

- A. Electric door locks and power transfer hinges shall be provided and installed under the architectural hardware contract.

1.5 SUBMITTALS

- A. Prior to the start of installation, submit 4 copies of the following for approval as ONE complete package. Submittal shall be rejected if items are missing.
 - 1. Description of operation.

2. Technical specification data sheets for all items. Indicate specific model number and options on sheets covering multiple models and options.
3. Samples of all exposed equipment and mounting hardware.
4. Shop drawings showing wiring diagrams, installation and mounting methods and details, point-to-point termination schedules. All drawings shall be fully dimensioned and prepared in a form compatible with AutoCAD. Contractor shall use the current version of the SIA/IAPSC CAD Security Symbols as shown on design drawings. Construction documents in electronic format will be made available to the successful contractor.
5. Unless otherwise instructed, contractor should not order any equipment until approvals have been granted. Contractor shall notify Construction Manager of any long lead time items.

B. System documentation to be submitted and approved prior to final acceptance:

1. Training and Operating manuals (3 copies each).
2. Record drawings, as-built and as-approved (1 full size set of prints and all CAD files in electronic file format), including plans, riser diagrams, installation details, wiring diagrams and point-to-point terminations. Drawings shall be prepared in a form compatible with AutoCAD. Contractor shall use the current version of the SIA/IAPSC CAD Security Symbols.

1.6 WARRANTY

- A. Security contractor shall warrant installed system to be free of defects of materials and workmanship for a period of one year following system acceptance by the Client. System acceptance shall be when all parts, components, sub-systems and systems have been tested and shown to be working in accordance with the specification and record drawings have been approved.
- B. During the warranty period provide service and maintenance as described in 1.7.

1.7 MAINTENANCE

- A. The bidder shall offer a complete contract maintenance service through a factory-approved (i.e., factory trained, authorized and equipped) local repair shop to maintain the installed system and the software for the duration of the maintenance contract.
- B. Servicing shall include the following:

1. Emergency maintenance service shall be rendered within 4 hours of notification of emergency. (Emergency service shall be required is a system, sub-system, device, or component failure requires the implementation of alternative security measures (e.g., posting of security officers) to maintain an equivalent security level.)
2. Non-emergency repair requests shall be rendered within 24 hours.
3. Replacement of defective parts and components as required.
4. Service shall be by factory trained service representative.
5. Maintain field panel system programming and incorporate manufacturer's software upgrades at no additional cost.
6. Scheduled preventive maintenance is to be performed semi-annually. This shall include complete testing of all security and field components for compliance with these and manufacturers' specifications and cleaning of all components.
7. Submit periodic (at least 2 per year) maintenance reports to the Client documenting routine and emergency maintenance procedures performed during interim. Include detailed description of symptoms, diagnosis and subsequent action taken during all maintenance procedures.

C. Replacement Parts.

1. The bidder shall maintain a replacement parts department and provide test equipment when needed. A complete parts depot shall be located in a geographical proximity consistent with the most expedient method of shipping replacement parts. An ample stock of individual components and equivalent unit replacements shall be carried for as long a period as demand warrants. This period shall extend well beyond the normal life expectancy of the equipment. Test equipment and tools shall be designed, tested, and qualified to meet the needs of the product servicing. Calibration service shall be available on all test instruments.
2. Any device that cannot be repaired on-site within 4 hours of arrival of service representative shall be immediately replaced with a replacement device in good working order. Client's device shall be re-installed when repairs are complete.

1.8 TRAINING MANUAL

- A. Prepare a simple instruction sheet describing the method of operation of the narcotics cabinet and first level diagnostics in the event of problems.
- B. Submit instruction sheet to Owner for review. Revise as required to obtain approval.

- C. Once approved, supply 20 copies of the instruction sheet to the Owner.

1.9 TESTING

- A. Contractor shall submit detailed test checklist and descriptive methodology for approval at least 4 weeks prior to start of testing.
- B. Contractor shall provide a temporary access control system server, e.g., portable computer, to simulate all function of the installed system and to simulate two-way data transfer via modem.
- C. Prior to requesting the witnessing of acceptance testing, contractor shall perform a 100% test and shall certify in writing to the Owner that the system is fully functional and operating per these and manufacturers' specifications. If, after issue of certification of readiness for acceptance testing, it is evident that the system is not installed and/or functioning per specifications, tests shall be abandoned until all work is complete and the contractor shall be back-charged for the time spent by the Owner and/or Owner's representative.
- D. Defective items shall be documented in a punch list and submitted to the contractor for correction. When all punch list items have been resolved, contractor shall again certify in writing that the system is complete. Owner or Owner's representative shall witness re-testing of the system, not necessarily restricted solely to the punch list items. If all items have been resolved, the contractor shall be provided with a certificate of successful acceptance test completion. (Note: final system acceptance shall not be given and warranty period shall not start until all as-built documentation has been approved.)
- E. If there are any additional system or component defects, a new punch list shall be prepared and issued. The time required by the Owner or Owner's representative for the preparation of this second and any subsequent punch list(s) and additional witnessing of testing shall be back-charged to the contractor.
- F. Contractor shall provide the services of fully qualified technicians and portable communications systems between test points and the simulated system head-end. Complete field tests shall be performed on all sub-systems. Each individual device shall be tested and proven correct in function and response. Tests shall demonstrate the response time of each different type of input sensor and output control device. Response time shall be measured with the system functioning at full capacity.

PART 2 - PRODUCT

2.1 ACCESS CONTROL/ALARM MONITORING (AC/AM)

2.1.1 SCOPE

- A. The existing AC/AM system consists of a head end server at FDNY HQ. New security scope under this contract includes security devices and field panels.
- B. Card readers shall be smart card technology and of standard Wiegand communications protocol. Badge cards are not required under this contract.
- C. Biometric vascular readers shall be IP-addressable and shall connect via the FDNY WAN to FDNY HQ in addition to connection to the local field panel via Wiegand protocol.
- D. All alarms shall be supervised for cut and short. All alarms and access control transactions shall be transmitted to the FDNY HQ server via the FDNY WAN.
- E. Inputting and updating of alarm and card access data shall be performed by FDNY personnel at FDNY HQ. The required subset of the server database shall be downloaded to the EMS station via WAN.

2.1.2 OPERATION

- A. The field panel shall control the remote reader doors (including doors to the narcotics cabinets) by comparing the time, location, and unique card number of an attempted entry with information stored in memory.
- B. Access will be granted only when the user's card is valid for the current time zone and for the reader where it is used.
- C. When all conditions have been satisfied, a signal to the door lock shall enable access at that location.
- D. Two biometric vascular readers, designated "A" & "B", shall be mounted adjacent to each narcotics cabinet shall be used to read biometric credentials from two individuals. The first individual shall be a Paramedic/Medical Technician who shall use vascular reader "A". The second individual shall be a Supervisor who shall use vascular reader "B". If both credentials are valid, and the second credential is presented within 15 seconds of the first transaction, the door shall unlock.

If both valid card reads is not completed within 15 seconds, or if either or both reads are valid but the door is not opened within a further 15 seconds, the door shall automatically re-lock and the "Two-man Rule" logic shall be reset. The door shall automatically re-lock on closure. The "Two-man Rule"

validation shall be performed at the station field panel; the access decision shall not require communication to the FDNY HQ server.

- E. Biometric vascular reader for ALS Room door shall, in conjunction with the proximity reader, be used for biometric reader system enrollment.
- F. The field panel shall transmit the user identification, time, and reader location to the FDNY HQ server. If access is not granted for any reason, the transmittal shall include the user identification, time, reader number, and a message indicating the reason for rejection.
- G. The field panel shall constantly poll all readers. If a reader is disabled (cut cable, failure, etc.) an alarm condition shall be transmitted with the time, reader address, and a message indicating that the reader is disabled. A report shall be transmitted when the reader becomes active again.
- H. All alarm condition shall be transmitted providing the time, location, alarm type, alarm detector identity.

2.1.3 MATERIAL

A. Wire and Conduit

- 1. Provide wire in accordance with manufacturer's specification.
- 2. All security cabling shall be installed in conduit.
- 3. All wire shall be plenum rated.

B. Identification and Tagging

- 1. Labels, tags or other permanent markings shall identify all cables, wires, terminal blocks and terminals.
- 2. All markings shall clearly indicate the function, source and destination.
- 3. All termination points shall be appropriately labeled.
- 4. All identifications, markings, and labeling shall be clearly shown on as-built drawings.

2.1.4 EQUIPMENT

A. Card Reader

- 1. Visual and audible indication that a card has been decoded and deemed valid or invalid shall be provided at each reader. Reader visual indication shall normally be red when associated relay is locked and green during the time that the associated relay is unlocked by valid card read.

2. The height and location of the card readers shall be coordinated with architectural drawings.
3. Card reader shall be HID model RP40 multiCLASS or approved equal, and shall read standard HID iClass cards. (Cards are separately procured by FDNY HQ.)

B. Vascular Reader

1. The two vascular readers for each narcotics safe shall be identified by permanent markings as "A" and "B". Narcotics cabinet card readers shall be surface mounted adjacent to the cabinet.
2. Front door control vascular reader shall be installed in an 18 1/4" H x 7 7/8" W x 6 7/8" D (exterior dimensions) stainless SS 316 weather-proof enclosure manufactured from 16 GA bent plate with a thermostatically controlled, low voltage fan set to activate when the internal temperature exceeds 90 °F and a blanket heater element with thermostat set to energize the heater at temperatures below 32°F. The reader shall be mounted on a removable 17 3/8" x 7" back plate supported at 4 corners by 3/8-16 threaded rod with nuts. The enclosure shall have a door with weather sealing, a 4"x4" louvered ventilation section centered on the door, a continuous (piano) hinge, a 4" H x 1" D bent SS 316 3/8" rod pull handle and an SS 316 ball-style grab catch. The enclosure shall be surrounded by a 1 1/16" wide trim plate. The door shall be painted to match the wall finish.
3. Wall mount vascular reader with integral Mifare, or approved equal reader module at ALS Room door. The readers shall be used for access control and for biometric system enrollment.
4. Provide and install, on the plywood backboard in the Server Room, TechSphere or approved equal power supplies for all vascular readers. Install and connect low voltage cable to readers and connect power supplies to main electrical power.
5. Vascular readers shall be TechSphere model VP-II X with integral Mifare smart card reader module or approved equal.

C. Field Panel

1. Provide one 16-reader capacity field panel at location specified on drawings. Mount on fire-resistant, 3/4" ply backboard.
2. Field panel shall control door locks and have auxiliary input/output circuits.

3. Field panel shall be programmable by data downloaded via FDNY's WAN from the FDNY HQ AC/AM server.
4. Field panel shall be equipped with a minimum of 4-hour battery back-up.
5. Field panel shall be installed in a lockable enclosure with case tamper switches to transmit alarm signals if the door is opened or the panel is removed from the wall.
6. Field panel shall be Software House model iStar-Pro or approved equal, and shall be compatible with FDNY HQ C-Cure 800 security system and software.

D. Power Supply Enclosure

1. Low voltage power supplies for the field panel and locks shall comply with applicable provisions of local building codes and national electrical code and shall meet requirements of authorities having jurisdiction.
2. Power supplies shall be installed in an enclosure shall be mounted directly underneath the field panel (as shown on drawing) on a fire-resistant backboard. All exposed cable shall be installed in conduit or metal raceways. Enclosure shall be protected by a UL listed lock and a door tamper switch monitored by the field panel.
3. Main power connections shall be hard-wired. Provide utility power outlet in enclosure.
4. Power supplies shall be equipped with over-voltage protection for both transient and power supply malfunctions. Lock power supplies shall be equipped with separate fuse for each lock device.
5. Power supplies shall be equipped with a monitored output (secondary circuit) to annunciate loss of primary power, low battery, circuit failure, and open/short circuits. Alarms shall be monitored by the field panel.
6. Power supplies shall be provided with back-up battery power to maintain complete operation of the field panel, card readers, vascular readers, horns, glass break sensors and electrified door locks for a minimum of 4 hours in the event of main power failure.
7. Power supply enclosure shall be Software House model APS AS0063-01 or approved equal.

E. Door Locking Hardware

1. Access controlled door locking hardware (electric storeroom function locksets, electric latch retraction exit devices, exit device power supplies and power transfer hinges) shall be supplied and installed by others.
2. The electric locksets shall be Schlage model L9080 EU x RX (fail secure) or approved equal. Electric latch retraction exit device shall be Dorma rim-mounted x ES x MS or approved equal. Power transfer hinges shall be 4-wire type or Von Duprin EPT or approved equal.
3. The security contractor shall be responsible for the wiring of locking devices from the frame side of the power transfer hinges to the field panel and supplying and installing all lock power supplies.

F. Narcotics Cabinets

1. Supply and install the narcotics cabinets as shown on drawing. Firmly fix to wall backboard with lag bolts.
2. Narcotics cabinet shall be fabricated from polished #11 gauge steel, shall be of anti-pry construction, and shall be supplied complete with a door installed with tamper resistant hinges and anti-pry construction. Overall dimensions shall be 20"W x 12"H x 8"D. Cabinets shall be provided with two height-adjustable shelves supported by standards.
3. The door shall be secured by means of a heavy-duty, bullet nosed, spring loaded electric deadbolt (fail-secure). Bolt holding force shall be 2,500 lbs. The bolt shall be integral with cabinet construction.
4. The door shall be equipped with a door position switch (DPS) to verify that a transaction occurred, or that the door was left open, or forced. The DPS shall be closed loop, low power, wide gap with integrally molded wire leads.
5. All wiring for card readers, lock, and DPS shall be internally concealed.
6. Narcotics cabinet shall be SafeTrak Narcotics Cabinet, #ST2833 manufactured by Electronic Storage and Audit Systems, Inc. (914/771-9739), or equal approved by FDNY.

G. Magnetic Door Position Switch (DPS)

1. DPSs shall annunciate alarms upon increase, decrease, or attempted substitution of external magnetic field when they are in the normally secured position.
2. DPSs shall have a housing of cast nonferrous durable material. Provide reasonable protection against moisture and dust. All cabling shall be hidden and protected. DPSs shall be installed with end-of-line resistances at the switch.

3. DPSs for the building doors noted on drawings shall be wired to the field panel. Activation of any DPS shall initiate an output signal to sound the local alarm horns for the duration that any DPS is active, i.e., horn shall sound only when a door is open, even if opened following a valid card read. Building door DPS alarms shall not be transmitted to FDNY HQ.
4. If a DPS alarm zone has been set to by-pass mode (non-alarm status) by FDNY HQ administration, alarm horn shall not sound when door is opened.
5. DPS shall annunciate an alarm if the switch housing is moved more than 1 inch from the magnet housing.
6. DPS shall be rated for a minimum of 500,000 activations without malfunction.
7. Sentrol, 1076 series, or approved equal, off-white.

H. Local Horn Annunciator

1. Horns shall be mounted at the locations shown on plans.
2. The horn shall sound upon activation of any of the door alarm switches, unless the activated switch is placed in by-pass mode (see subsection F. above). The horn shall be controlled by an output relay from the field panel. The horn shall cease to sound within a user definable time (from 0 to 60 seconds) of when the door alarm switch is reset.
3. Horn shall be mounted flush on a standard single gang box at 8ft AFF.
4. Designed Systems, Inc., Door Prop Alarm ES411 stainless steel finish or approved equal.

I. Motion Detector - Beam

1. Detection beams shall be installed across Apparatus Room roll-up doors as shown on plan drawings. Mounting height shall be 12" AFF.
2. Unit shall initiate alarm condition when beam is broken and shall automatically reset within 5 seconds of transmitter reacquiring receiver.
3. Unit contact shall be wired to field panel which shall control local alarm output to wall mounted horns within the station.
4. Transmitter and receiver units shall be mounted at a height of 12" AFF.
5. Transmitter and receiver system shall be Optex model AX70TN, or approved equal.

2.2 VIDEO SYSTEM

2.2.1 SCOPE

A. The Video System shall consist of:

Cameras; lenses; enclosures; video displays, network cabling, network switchers and digital video recorders. The contractor shall provide such additional equipment (synchronization, amplification, ground loop correction, and connections) as shall be necessary to ensure quality, roll free, viewed and recorded camera images.

B. The video system shall consist of fixed interior and exterior dome color cameras with variable focus-lens. Cameras shall be provided with wide dynamic range. Cameras shall connect to a local area network via a Cisco managed network PoE switch (provided by FDNY).

C. A digital video recorder with capacity for 8 IP-addressable cameras shall record video from the IP cameras. Real time and archive video shall be accessible for display at a local client workstation (to be located in the EMS Station Office) and, via the FDNY WAN, at FDNY HQ on existing equipment.

D. The digital video recording system shall interface with the AC/AM system for the provision of alarm-based recording and display modes.

2.2.2 MATERIALS

A. Cable

1. Cat6e cable shall be used for all video transmission.
2. Cat6e cable and control cables shall be installed in metal conduit unless concealed in a drop ceiling. Unprotected cable in plenum ceilings, and where required by code, shall have Teflon outer jacket.
3. Supply and install additional Cat6e cable from the DVR location to the space above each perimeter door for future cameras. Provide additional 6ft coil at both ends of cable.

B. Identification and Tagging

1. Labels, tags or other permanent markings shall identify all cables, wires, terminal blocks and terminals.
2. All markings shall clearly indicate the function, source and destination of all cabling, wiring and terminals. All markings shall be recorded on as-built drawings.

2.2.3 EQUIPMENT

A. Digital Video Recorder (DVR)

1. Supply and install a digital video recorder with sufficient capacity for the cameras included in the project scope. Each recorder shall be equipped with a hard drive for archiving. Recorders shall connect via network switches (provided by FDNY) to a dedicated network.
2. DVRs shall have integrated network capabilities to be used for display of video signals at the EMS Station Office workstation display screen.
3. DVR shall record camera images as follows:
 - a. All cameras where there is no video activity: one image per second.
 - b. Cameras where motion has been detected or where an external alarm signal has been received: 30 images per second from 5 seconds before the motion detection/alarm receipt until 30 seconds after normalization of the alarm condition.
 - c. Video images shall be recorded and played back at a minimum of 704 x 480 pixels with H.264 format.
 - d. Stored video images shall be archived for 30 days and video data storage shall be sized appropriately.
4. DVR shall permit viewing of live or archived video images at the video server and at a PC workstation connected with the server. Provide screen, keyboard and pointing device at rack to facilitate DVR set-up, configuration and maintenance.
5. Provide compatible administrator/client workstation in Lieutenant's Office with client software, 22" screen, keyboard and pointing device for monitoring of live video and playback of archive video.
6. Archived video data shall be stored on fast, random access, hard drive units with RAID5 redundancy. Unit shall annunciate alarm conditions on disk or communications failure.
7. Archived video clips and stills shall be recordable on CD-ROM or DVD in an industry standard format, e.g., JPEG or MPEG, and in a "watermarked" format for evidentiary data. The watermarked format shall provide visual proof that the recording is original and has not been altered.
8. DVR shall be rack mounted in location shown on plan drawings.
9. DVR shall be manufactured by Veracity, model Coldstore or approved equal.

B. Fixed Interior Color MiniDome

1. The camera shall be an IP-addressable mini-dome color camera, utilizing a 1/3" type CMOS progressive scan video capture element. The camera shall have a digital video output producing 30 frames per second with a resolution of 896 x 720 pixels in H.264 format. Camera shall have wide dynamic range of 100db.
2. Camera domes shall be flush or surface, ceiling or wall mounted depending upon location.
3. The camera shall be equipped with a varifocal 3.3 – 12mm DC auto iris lens and shall have a clear dome.
4. The camera shall be powered by PoE IEEE 802.3 af via CAT6 cable.
5. Camera shall be Axis Communications model P3344 or approved equal.

C. Fixed Exterior Color Environmental Dome Camera

1. The camera shall be an IP-addressable dome color camera, utilizing a 1/3" type CMOS progressive scan video capture element with day/night functionality. The camera shall have a digital video output producing 30 frames per second with a resolution of 1280 x 960 pixels in H.264 format. Camera shall have wide dynamic range of 100db.
2. Dome housing shall have environmental controls to maintain levels of temperature and humidity within manufacturer's operations specifications.
3. Camera dome shall be mounted at 8ft height on a 16ft high light pole in the parking lot as shown on site drawing SEC-0.
4. The camera shall be equipped with a varifocal 3.3 – 12mm DC auto iris lens and shall have a clear dome.
5. Install a weather resistant, lockable junction box mounted at the base of the light pole with 3ft clearance above the ground.
6. Video signal and low voltage power shall be transmitted over be CAT6e PoE cable.
7. Provide effective high energy transient voltage suppression, surge current diversion, and noise attenuation for all electrical modes of equipment connected downstream. Devices shall be manufactured by DITEK Corp.
8. Camera shall be Axis Communications model P3364VE with pendant clip and pole mounting hardware or approved equal.

D. Security System Rack

1. Supply and install free standing half-height vertical metal equipment rack in Telco Room to house network switch, HDVR and UPS system.
2. Racks shall be equipped with side rails for mounting of security equipment. Rails shall have standard EIA hole spacing and 19 in. width.
3. Submit drawings, showing equipment layout, cabling, and terminations as part of shop drawing submittal.
4. All metal edges and welds shall be deburred and filed smooth. Sharp corners shall be blended. All metalwork shall be free of rust and grease prior to application of primer paint coat.
5. Final finish paint coat shall be baked enamel. Owner shall select color and texture from console manufacturer's standard colors. Submit color chart with console shop drawings and coordinate color selection prior to ordering equipment.
6. Provide and install in rack a UPS system to support power to HDVR and network switch for a minimum of 30 minutes. Unit shall connect to HDVR to provide an orderly shut-down after 20 minutes without main power. Unit shall annunciate status at EMS Station Office.
7. Rack shall be manufactured by Middle Atlantic, or approved equal.

2.3 VIDEO INTERCOM SYSTEM

2.3.1 SCOPE

A. The Video Intercom System shall consist of:

1. Video Intercom door stations at Front Door and Rear Door.
2. Video Intercom master station in EMS Station Office and 2nd Floor Lounge Area.
3. Power supplies and cable.

B. Equipment:

1. Video Intercom door substation shall be vandal and weather resistant, flush-mounted, stainless steel with push-to-talk button, speaker grill and microphone. Mount at location shown on plan drawings. Home-run connect to master station. Power shall be supplied by the master station. Unit shall be Aiphone JA-DGV or approved equal.
2. Video Intercom master station shall be flush, wall-mounted and shall annunciate call requests from the substation both audibly and visually. Operator shall select a button for the calling station and shall have hands free two-way communication. Master shall have a door release button to unlock the door associated with the intercom call. Unit shall be Aiphone JA-2MECD or approved equal.

3. A second video intercom master station shall be wall-mounted in the 2nd Floor Lounge area as shown on plan drawings. Unit shall annunciate call requests, permit two-way communication with the door stations and the other master station, but shall NOT permit remote unlocking of doors.
4. Provide and install power supply at EMS Station Office. Unit shall connect to main voltage power receptacle and master station. Unit shall be Aiphone PS-2420UL or approved equal.

END OF SECTION

SECTION 310000

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Work included: This work includes:
 - 1. General excavation and earth moving.
 - 2. Fine grading.
 - 3. Removal of excess materials.
 - 4. Erosion control measures.

1.03 RELATED WORK:

- A. Related Sections include the following:
 - 1. Site Preparation: Section 311000
 - 2. Trenching and Backfilling: Section 310000
 - 3. Landscaping: Section 329100

1.04 SITE INSPECTION

- A. The Contractor shall inspect the site prior to bidding and be familiar with the site conditions. The survey included in the drawings and documents are for information only, and it shall be the responsibility of the Contractor to verify the conditions on site prior to construction.

1.05 SUBMITTALS

- A. Submittals shall conform to the provisions of the General Conditions and as specified herein.
- B. Submittals required:
 - 1. Test results for crushed stone showing gradation by sieve size.
 - 2. Test results for soil fill showing gradation by sieve size and percentage organic content, and density.

1.06 COORDINATION AND PROTECTION OF UTILITIES

- A. The Contractor shall coordinate his work with other trades. Utility locations shown on the drawings are for information only. It shall be the Contractor's responsibility to verify the location of all existing utilities and protect them from all damage during the course of the work. Should the Contractor encounter any utilities or services during the performance of the work, he shall notify the Owner, the Owner's Representative, and the City Department or the Utility Company owning or controlling services to temporarily cut off these services. Any damage caused to existing utilities shall be repaired at the Contractor's own expense. See Site Preparation & Removals Section 311000 for more information.

1.07 PERMITS AND CODES

- A. The Contractor shall comply with all rules, regulations, laws and ordinances of New York State, and all other authorities having jurisdiction. All labor, materials, equipment and services necessary for the work to comply with such requirements shall be provided without additional cost to the Owner.
- B. The Contractor shall comply with the provisions of "The Manual for Accident Prevention in Construction" of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.
- C. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings. The Contractor shall notify all utility companies in writing and locate in field all existing utilities before starting construction.
- D. The Contractor shall not close or obstruct any public or private street, sidewalk or passageway without first obtaining written permit from the City of New York or other agency having jurisdiction, and shall conduct his operations so as to interfere as little as possible with the use ordinarily made of roads, driveways, sidewalks, or other facilities.

1.08 SITE MEETING

- A. The Contractor shall arrange a site meeting to determine the scope of excavation work.
- B. Prior to the site meeting the Contractor shall clearly mark out on the ground the location of all proposed foundations, trenches, and all other areas requiring cutting.

1.09 COMPACTION TESTS

- A. All tests shall be performed by an independent commercial testing laboratory, acceptable to the Project Manager or Landscape Architect, at the expense of the Contractor.
- B. Tests for compaction of fill materials shall determine the maximum dry density and optimum water content in accordance with ASTM D-1557 method D, and the in-place density in accordance with ASTM D-1556.
- C. Compaction requirements shall be as specified herein. Areas for which tests show insufficient compaction shall be re-compacted and re-tested until all areas conform to the specified requirements.

1.10 GRADES

- A. The words "finished grade" as used herein shall mean the final grade elevations indicated on the drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slope between points for which finished grades are indicated, or between such points and existing established grades.

PART 2 - GENERAL

2.01 CRUSHED STONE

- A. Shall consist of sound, tough, durable stone, free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. Crushed stone shall conform to NYS DOT Type 4 Subbase Course Material, and shall meet the following gradations:

<u>U. S. Sieve Number</u>	<u>Percent Passing by Weight</u>
2"	100

1/4"	30-65
#40	5-40
#200	0-10

2.02 SOIL FILL

- A Shall consist of sand, gravel, rock fragments, quarry run stone, broken stone, or mixtures thereof, and shall meet the following requirements:

- | | |
|-------------------------|---------------------------------|
| 1. Organic Matter: | 6% maximum |
| 2. pH | 5.0 - 7.0 |
| 3. Soluble salts | Less than 1500 micromhos per cc |
| 4. Density | 100 lbs per cubic foot minimum |
| 5. Mechanical Analysis: | |

<u>U. S. Sieve Number</u>	<u>Percent Passing by Weight</u>
2"	95-100
3/4"	90-100
# 40	50-70
# 200	2-10

- B. Stones or coarse material larger than 2" in any direction but not exceeding six inches in any direction will be permitted in fill layers three feet or more below the finished surface of the fill.
- C. Soil fill shall contain no organic or compressible materials, no plastic materials or materials subject to decay or decomposition, no cinders or materials which may corrode pipes or metals.
- D. Soil fill material shall be capable of compaction to specified densities. It shall have a maximum density of 100 lbs per cubic foot.

PART 3 - EXECUTION

3.01 GENERAL

- A. The drawings indicate alignments and elevations. The Project Manager or Landscape Architect may make adjustments in grades and alignments as necessary to avoid interference with any special conditions encountered. Grading between indicated final grades shall be smooth, even surfaces, except as otherwise required.
- B. Excavate all materials to the elevations, dimensions, and forms as shown on the drawings and as specified for the construction of site structures, utilities, pavements and other improvements necessary for completion of site work as defined herein.

3.02 PROTECTION OF EXISTING FEATURES

- A. The Contractor shall exercise care to protect all existing underground and overhead utilities, curbs, paving, lawn, trees, lamp posts and other structures to remain, and shall be responsible for any damage he may cause to them during construction. All damage shall be repaired or replaced to the satisfaction of the Project Manager or Landscape Architect at no additional cost to the Owner.

3.03 GENERAL EXCAVATION

- A. All soft, boggy, clayey or other objectionable material below the proposed subgrade shall be removed, and the area refilled with soil fill as specified herein.

- B. The Contractor shall remove all boulders, stones, pieces of concrete, lumber, iron or other material that projects above the proposed subgrade. Any stone larger than two cubic feet in volume shall not be placed within two feet of the proposed finished surface.

3.04 BACKFILLING

- A. No fill shall be placed on snow, ice, uncompacted or frozen material, and no fill containing ice or frozen lumps shall be used. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
- B. No large stones or coarse material over two inches in any dimension shall be used for backfilling within the top three feet of filled areas. Below three feet larger material may be incorporated to a maximum of six inches in any dimension provided compaction requirements can be met.
- C. Fill shall be placed in successive horizontal lifts no thicker than eight inches (8") before compacting, and each lift shall be compacted by means of vibrators or pneumatic tampers. Compaction of each lift shall be tested for compliance with densities as specified herein.
- D. All fill is to be placed "in-the-dry", to which end dewatering may be required. Spreading and drying of each layer may also be required. However, if the Testing Laboratory determines that the fill is too dry for proper compaction, water shall be added to provide the specified optimum moisture content, as necessary for proper compaction.
- E. The following densities shall be achieved for placed fill materials:
 - 1. Footings: 95% maximum dry density.
 - 2. Fills at Pavements & Structures: 95% maximum dry density.
 - 3. Lawn & Planted Areas: 90% maximum dry density.

3.05 DRAINAGE AND DEWATERING

- A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.
- B. Should surface, rain or ground water be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping or temporary ditches to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties from such water. Pumping associated with dewatering shall be discharged through haybale filters to existing storm drains as approved by the Architect.
- C. Presence of ground water in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete in excavation containing free water.

3.06 EROSION CONTROL

- A. The Contractor shall provide suitable and adequate means of protection during construction in accordance with Section 02270: Temporary Soil Erosion and Water Pollution Control.

3.07 GRADING

- A. Grading shall include the shaping, trimming, rolling, and refinishing of all surfaces and the preparation of grades as shown on the drawings. Grading may be done by machine methods. All ruts shall be eliminated. Allow for thickness of final surface treatments or topsoil depths as specified in Section 329100: Planting.

- B. If, during construction any pipe, utility line or other construction is damaged due to operations under this Contract, the Contractor shall repair all damage at no additional cost to the Owner and restore damaged areas to their original conditions.
- C. Do all other cutting, filling and grading to the lines and grades indicated on the drawings. No stones larger than six cubic inches shall be placed in upper three feet (3') of fill. Fill shall be left in a compacted state at the end of the work day and sloped to drain.
- D. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.
- E. Placed fill materials which become disturbed shall be regraded and recompact. Fill materials which become contaminated shall be removed and replaced, as directed by the Project Manager or Landscape Architect.

3.08 REMOVAL OF SURPLUS MATERIALS

- A. Surplus excavated materials and all excess debris, rubbish, etc., shall become the property of the Contractor, who shall remove and legally dispose of materials off-site, at no additional cost to the Owner.

END OF SECTION 310000

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SECTION 311000

SITE PREPARATION AND REMOVALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This work includes but is not limited to the following:
 - 1. Removal of existing concrete, asphalt, gravel, and other pavements, walls and curbs, as shown on the drawings.
 - 2. Removal of miscellaneous signs, posts, fencing, etc. as shown on the drawings.
 - 4. Removal of existing trees, as shown on the drawings.
 - 5. Clearing and grubbing of existing vegetation, as shown on the drawings.

1.03 RELATED WORK

- A. Tree Protection and Selective Pruning – Section 311300
- B. Earthwork – Section 310000
- C. Trenching and Backfilling – Section 310620

1.04 COORDINATION AND PROTECTION OF UTILITIES

- A. The Contractor shall coordinate his work with other trades. Utility locations shown on the drawings are for information only.
 - 1. It shall be the Contractor's responsibility to locate all existing utilities and protect them from all damage during the course of the work.
 - 2. Contractor shall notify the City of New York or the Utility Company owning or controlling services to temporarily cut-off utility services, if required to complete the work.
 - 3. Any damage caused to existing utilities shall be repaired at the Contractor's own expense.
- B. Contractor is alerted to the rules of New York State Industrial Code Rule 53 and is directed to comply. Contractor shall notify all utility companies, by calling the Dig Safely New York Local Notification Center, "Dig Safely", telephone (800) 962-7962. Contractor shall call for notification at least 2 and not more than 10 days in advance of construction. Contractor shall also call the "Dig Safely" number to set up a pre-demolition conference at least 7 full working days before the start of any excavation or construction.

1.05 PERMITS AND CODES

- A. Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.
- B. Contractor shall comply with all rules, regulations, laws and ordinances of the State of New York, and all other authorities having jurisdiction. All labor, materials, equipment and services necessary for the work to comply with such requirements shall be provided without additional cost to the Owner.

- C. Contractor shall comply with the provisions of "The Manual for Accident Prevention in Construction" of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.

1.06 SITE MEETING

- A. The Contractor shall arrange a site meeting to determine the exact location of temporary tree protection fencing and tree removals with the Landscape Architect and such additional persons as the Landscape Architect deems necessary.
- B. Prior to the site meeting the Contractor shall clearly identify, by tags, paint or other method, all trees to be removed and all trees to be protected. Landscape Architect shall verify trees at the time of the site meeting.
- C. Prior to the site meeting the Contractor shall clearly mark out on the ground the location of all proposed foundations, trenches, and all other areas requiring cutting.
- D. At the time of the site meeting, Contractor shall document existing condition of trees to be protected, with photographs. At least four photographs of each tree shall be required, taken from different locations around the tree to provide an overall view of the existing shape and condition of each tree. Contractor shall provide one complete set of printed photographs to Owner, and one complete set to Landscape Architect.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SITE INSPECTION

- A. Contractor shall inspect the site prior to bidding and be familiar with the site conditions, including the location of all underground and overhead utilities. It shall be the responsibility of the Contractor to obtain accurate locations of all underground utilities. Contractor shall verify the locations of all trees and other site features prior to construction.

3.02 PROTECTION OF EXISTING FEATURES

- A. Contractor shall exercise care to protect all existing underground and overhead utilities, curbs, paving, lawns, lamp posts and other structures to remain, and shall be responsible for any damage he may cause to them during construction. All damage shall be repaired or replaced to the satisfaction of the Project Manager or Landscape Architect at no additional cost to the Owner.

3.03 PROTECTION OF EXISTING TREES

- A. All trees to remain shall be protected from damage to trunks, branches and roots.
 - 1. Do not disturb the natural grades inside the root zone of such trees unless otherwise indicated. (Root zone shall be considered equal to the branch spread of the tree.)
 - 2. No materials or equipment shall be stored within the root zone of existing trees.
- B. Tree protection fencing shall be installed prior to the start of site removal operations in accordance with Section 311300 – Tree Protection and Selective Pruning:

3.04 TREE REPLACEMENT

- A. Any damage caused to trees by the work of this Contract shall be immediately remedied by Contractor.

1. Remedial work may include pruning, wound treatment, cabling, or additional support measures, as determined by the Landscape Architect.
 2. Contractor shall engage a licensed arborist to perform such work, as approved by the Project Manager or Landscape Architect.
 3. All required remedial work shall be performed to the satisfaction of the Landscape Architect, at no additional cost to the Owner.
- B. If damage to any tree is severe, as determined by the Landscape Architect, it shall be replaced with a new tree or trees of equal or greater aggregate caliper than that of the damaged tree.
1. Landscape Architect shall specify the number, size and species of replacement trees required.
 2. Such trees shall have a minimum of 6-inch caliper and shall be approved by the Landscape Architect prior to planting.
 3. All replacement trees shall be installed in accordance with all the requirements of Section 329100 - Planting.
 4. Replacement trees shall be supplied and installed at no additional costs to the Owner, and in addition, Contractor shall be responsible for all incidental costs associated with such tree replacement, including but not limited to the costs of the Landscape Architect's inspection of trees at the nursery, and such other time and expenses as may be incurred by the Landscape Architect in association with such tree replacement.

3.05 TRENCHING & EXCAVATION AT TREES

- A. All excavation or trenching required within the area of existing tree roots shall be carried out by hand.
1. Roots in trench shall be cut smooth and clean using sharp tools.
 2. No jagged edges of roots shall be permitted.
 3. Sides of excavation or trench shall be clean and straight.
 4. No excavation or trenching at tree roots shall be permitted prior to or during windy or rainy weather.
- B. Immediately following excavation or trenching operations, area at tree roots shall be backfilled.
1. Roots shall not be left exposed overnight.
 2. Backfill shall consist of a mix of 50% soil mix, and 50% gravel.
 3. Backfill shall be installed in layers no greater than 8 inches in depth and hand compacted in place to fill all voids.

3.06 REMOVALS

- A. Areas of asphalt, concrete or other pavements, curbs, fences or walls shown on the drawings, or encountered in the course of the work, shall be excavated to their full depth, including base courses.
- B. All fence posts, posts, signs, etc. shown on the drawings to be removed, or encountered in the course of the work, shall be removed to the full depth of their footings.
1. Voids caused by such excavation shall be back-filled to finished grade with clean soil fill complying with Section 310000 - Earthwork, compacted to 95% maximum dry density.
- C. All removed materials shall be legally disposed of off-site in accordance with Section 1 "Construction Waste Management".

3.07 TREE REMOVAL

- A. Contractor shall remove existing trees as shown on the drawings, only after site meeting with Landscape Architect.
- B. Trees shall be removed only by workers skilled in such operations.
 - 1. Trees shall topped and limbed prior to removal.
- C. All branches and trunks greater than six (6) inches in diameter shall be cut into lengths of four (4) foot minimum to ten (10) foot maximum and stockpiled on site for reuse as log wheel stops.
 - 1. All other branches, limbs, leaves and debris shall finely shredded and stockpiled on site for reuse as mulch.
 - 2. Stockpiles shall be in locations approved by Owner, and stockpiled materials shall be protected from damage, removal or contamination throughout the course of the work.

3.08 STUMP REMOVAL

- A. The stumps of all removed trees, and any additional stumps found within the contract area, shall be grubbed and excavated to a depth of three (3) foot below existing grade.
- B. The voids resulting from stump removal shall be backfilled to finished grade with crushed stone, or clean soil fill, conforming to the requirements of Section 310000 - Earthwork, and compacted to 95% maximum dry density.

3.09 CLEARING & GRUBBING EXISTING VEGETATION

- A. At areas shown on the drawings Contractor shall remove all existing vegetation to a minimum of six (6) inches below existing grade.
 - 1. Removals shall include all plants, weeds, brush, vines, and stumps, within areas shown.
 - 2. Removals shall include all roots.
 - 3. Removals shall include all debris, stones and trash or other material that projects above the proposed subgrade.
- B. Following removal operations, rototill or disk entire area to a minimum depth of eight (8) inches below existing finished grade.
 - 1. Pass over entire area at least two times in different directions.
 - 2. This operation shall not be carried out when soil is wet or waterlogged.
- C. Following rototilling or disking, rake entire area to remove all stones, debris, or other materials greater than two (2) inches in diameter.
- D. Area shall be graded as required and shall be seeded as specified in Section 329100-Planting.

3.10 REMOVAL OF TEMPORARY PROTECTION MEASURES

- A. All temporary protection measures employed during the construction period shall be removed immediately prior to Substantial Completion unless otherwise directed by the Project Manager or Landscape Architect.

3.11 CLEAN-UP

- A. All debris and rubbish existing on site or generated by removals and site preparation operations shall be removed and legally disposed of off-site in accordance with Section 1 "Construction Waste

Management". Removal of rubbish and debris shall be performed as many times as necessary throughout the course of the project in order to maintain a neat and clean appearance at all times.

END OF SECTION 311000

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SECTION 311300

TREE PROTECTION AND SELECTIVE PRUNING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SCOPE

- A. Work of this section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver, install and perform all work of this Section as shown on the Drawings, as specified herein and/or as required by the job conditions.

- B. Work included: This work includes but is not limited to the following:

- 1. Supply, installation and removal of temporary tree protection fencing, as shown on the drawings.
- 2. Pruning existing trees to remain.
- 3. Removal of selected trees as shown on the drawings and as directed.
- 4. Pruning and trimming roots of existing trees to remain, as necessary.

- C. Related work specified elsewhere:

- 1. Site Preparation & Removals, Section 311000
- 2. Earthwork: Section 310000

1.03 COORDINATION AND PROTECTION OF UTILITIES

- A. The Contractor shall coordinate his work with other trades. Utility locations shown on the drawings are for information only. It shall be the Contractor's responsibility to verify the location of all existing utilities and protect them from all damage during the course of the work. Should the Contractor encounter any utilities or services during the performance of the work, he shall notify the Owner, the appropriate Municipal Department or the Utility Company owning or controlling services to temporarily cut off these services. Any damage caused to existing utilities shall be repaired at the Contractor's own expense. See Site Preparation & Removals, Section 311000 for more information.

1.04 PERMITS AND CODES

- A. All work shall conform to the drawings and specifications and shall comply with all applicable codes and regulations.
- B. The Contractor shall comply with all local, State and Federal rules, regulations, laws and ordinances. All labor, materials, equipment and services necessary for the work to comply with such requirements shall be provided without additional cost to the Owner.
- C. The Contractor shall comply with current tree pruning safety practices.
- D. The Contractor shall comply with the provisions of "The Manual for Accident Prevention in Construction" of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.

- E. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the drawings. The Contractor shall notify all utility companies in writing and locate in field all existing utilities before starting construction.

PART 2. - PRODUCTS

2.01 TREE PROTECTION FENCING

- A. Outer protective fencing:
1. Fencing shall consist of sound four foot high wood lath snow fencing, or four foot high plastic fencing, as "Alpi Safety Fence" as manufactured by B.F. Fence Company, P.O. Box 4121, Harrisburg, PA.
 2. Stakes for fencing shall be minimum six foot long galvanized stamped steel drive stakes.
- B. Individual tree fencing:
1. Fencing shall consist of (8) 2"x4"x varying length wood lumber, nailed together as shown in drawings.
 2. Stakes for fencing shall be 2"x4"x8' wood lumber.

PART 3. - EXECUTION

3.01 SITE INSPECTION

- A. The Contractor shall inspect the site prior to bidding and be familiar with the site conditions, including the location of all underground and overhead utilities. The surveys included in the drawings are for information only, and it shall be the responsibility of the Contractor to verify the locations of all underground utilities, trees and other site features prior to construction.

3.02 PRE-CONSTRUCTION MEETING

- A. The Contractor shall call a pre-construction meeting of all trades involved in any work which might impact any existing trees. Landscape Architect and Owner shall attend.
- B. The purpose of this meeting is to identify all trees within the work area to be retained and to set forth conditions of work adjacent to such trees, and determine any special methods of construction required to ensure their survival. Such special methods may include but not be limited to :
1. Additional fencing to that described herein.
 2. Special excavation techniques for installation of utilities, foundations, pavements, curbs or other below grade work in proximity to any existing tree=s root zone.
 3. Construction of grade beams or other devices to minimize excavation at tree root zone.
 4. Any methods required to avoid compaction of root zone and/or restore sub-soil conditions after construction is completed.

3.03 PROTECTION OF EXISTING FEATURES

- A. The Contractor shall exercise care to protect all existing underground and overhead utilities, curbs, paving, lawn, lamp posts, and other structures to remain, and shall be responsible for any damage he may cause to them during construction. All damage shall be repaired or replaced to the satisfaction of the Architect at no additional cost to the Owner.

3.04 PROTECTION OF EXISTING TREES

- A. The Contractor shall protect all existing trees from damage throughout the course of the work. No materials or equipment shall be stored within the root zone of existing trees. (Root zone shall be considered equal to the branch spread of the tree.) If any tree is severely damaged or killed during the course of the work, it shall be replaced with a new tree or trees with a total caliper equal in sum to

the combined caliper trees to be replaced (measured three feet above grade), and to the satisfaction of the Architect and at no additional cost to the Owner.

3.05 TEMPORARY TREE PROTECTION FENCING

- A. The fencing shall be installed in locations shown on the drawings prior to the start of any other construction work and without damage to any existing vegetation. If the fencing is damaged during construction it shall be immediately repaired or replaced.
- B. Stakes for fencing shall be located a maximum of five (5) feet on center, and shall extend at least two feet into the ground.
- C. The fencing shall remain in place during the course of construction. Upon completion of the work, or as directed by the Architect the Contractor shall remove and legally dispose of the fencing off-site.
- D. The Contractor shall not cause or allow any materials to be placed or stored within the boundaries of the fencing, and shall protect the vegetation within the fencing from damage at all times.

3.06 ROOT PRUNING

- A. Where excavation or other construction activity disturbs root system of any existing tree, root pruning shall be carried out to minimize damage to the tree. Consult with Landscape Architect before commencing any work within the drip line of any tree to determine root pruning measures.
- B. Trench for root pruning shall be hand dug by certified arborist in coordination with tree crown. Roots in trench shall be cut smooth and clean using sharp tools. No jagged edges of roots shall be permitted. Sides of trench shall be clean and straight, trench shall extend to a depth of 30 inches below existing finished grade, or as required to sever the feeding roots.
- C. Alternative methods of trenching using compressed air or hydraulic systems shall be approved by the Landscape Architects before work is begun.
- D. Trench shall not be dug prior to or during windy or rainy weather.
- E. Backfill at trench shall consist of a mix of 50% improved topsoil mix as specified under Section 02910: Planting, and 50% clean washed gravel, 3/4 inch to 1 2 inch size. Backfill shall be installed in layers no greater than 8 inches in depth and hand compacted in place to fill all voids.
- F. After root pruning had been completed, arborist shall evaluate extent of root pruning and make adjustments to the tree canopy with pruning as required to compensate for root loss.

3.07 CROWN PRUNING

- A. Prune crown of all trees which have required root pruning or which may have suffered from any damage, including soil compaction, during the construction period. Consult with Landscape Architect before commencing any crown pruning or other remedial work to determine extent and type of pruning required.
- B. All pruning shall be carried out by certified arborists experienced in tree climbing.
- C. Pruning and thinning work shall apply to the full height of affected trees. Pruning shall be carried out to preserve the natural character of the plant, in accordance with the American Nurserymen's Association Standards.

- D. Prune out all dead wood or suckers and all broken or badly bruised branches. Never cut a leader. All cuts shall be clean. Do not leave stubs.
- E. All cuts shall be made sufficiently close to the parent stem so that healing can readily start under normal conditions. Where possible pruning shall be done to a lateral branch (drop crotch pruning).
- F. All limbs one inch in diameter (the size of a quarter) and over shall be pre-cut to prevent splitting. All branches over 3.5 inches in diameter shall be lowered to the ground by ropes.
- G. Exercise all due care required to ensure that pruning operations do not create any hazards to life or property. Care shall include, but not be limited to, use of barricades and/or flagmen as required.

3.08 FERTILIZING EXISTING TREES

- A. Commercial Fertilizer (10-6-4) shall be used, delivered in standard size bags of the manufacturer. It shall be stored in such a manner that its effectiveness shall not be impaired. The fertilizer shall contain:
 - 1. Nitrogen 10%: One-half shall be in the form of standard organic matter of plant or animal origin (this excludes compounds of synthetic nature including urea and cyanamid) one-quarter shall be in the form of sulphate of ammonia.
 - 2. Phosphoric Acid 6%: Available phosphoric acid shall be derived from superphosphate, bone or tannage.
 - 3. Potash 4%: Potash shall be in the form of sulphate or muriate of potash.
- B. Fertilizer shall be applied to the existing trees by the pressurized deep feeding or perforation method. Fertilizer shall be used at a rate of three (3) pounds of fertilizer per inch of diameter of the trunk, measured at four and one-half (4.5) feet above the existing ground surface.
 - 1. Pressure feeding: shall be done using approved equipment so as to deliver fertilizer and water to the root system.
 - 2. Perforation method:
 - a. Holes of approximately two (2) inches in diameter by twelve (12) inches in depth shall be drilled in the soil around the tree using a power-driven or hand bar, or a power-driven or hand auger. The holes shall be spaced evenly around the tree at two (2) feet apart, in circular patterns, starting at a distance of five (5) feet from trunk. The holes shall be located within the entire area beneath the spread of the branches and shall extend beyond the spread of the branches by a minimum of three (3) feet.
 - b. Approximately one cup of fertilizer shall be placed in each hole and well watered in. The holes shall then be filled with a mix of 50% improved topsoil mix as specified under Section 329100: Landscaping, and 50% sand. Backfill shall be installed in layers no greater than 8 inches in depth and hand compacted in place to fill all voids.
- C. Do not apply fertilizer when the soil is excessively wet.

3.09 EXISTING PLANT MATERIAL PROTECTION

- A. The Contractor shall provide at his own expense any and all protection he deems necessary for all plants and lawn areas against damage prior to Final Acceptance of the work.
- B. Removal of Temporary Protection Measures: Any temporary protection measures employed during the construction period shall be removed prior to substantial completion unless otherwise directed by the Landscape Architect. Any guys, wires, rubber hose sections or stakes used for temporary bracing of trees or any tree trunk wrapping shall be removed and disposed of by the Contractor off site at his

own expense at the end of the guarantee period, or earlier at the direction of the Landscape Architect.

3.10 CLEAN-UP

- A. All pruned materials, tree stumps and any excavated materials not required for use as fill on site, debris, and rubbish existing on site or generated by site preparation or removal operations shall be removed and legally disposed of off-site. Removals shall be performed as many times as necessary throughout the course of the project in order to maintain a neat and clean appearance.

END OF SECTION 311300

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SECTION 313419

GEOTEXTILE

PART 1 - GENERAL

1.01 SCOPE OF WORK:

The Contractor shall furnish all labor, material, tools and equipment and install all geotextiles required by the Contract Documents.

1.02 SUBMITTALS

The following items shall be submitted to the Construction Manager for review and approval in accordance with SECTION: SUBMITTALS.

- A. Written certification that each geotextile meets or exceeds the required minimum property values specified.
- B. Manufacturer's written instructions for storage, handling, installation, and seaming of geotextile along with the conditions of his warranty.
- C. Sample of each proposed geotextile.
- D. Method of securing overlaps, including data on the thread used in stitching.
- E. Method of placing and securing the geotextile around pile penetrations.

1.03 APPLICABLE STANDARDS

The publications are referenced by the basic designation and shall be the latest published version.

- American Society for Testing and Materials (ASTM)

ASTM D1777 Method for Measuring Thickness of Textile Materials

ASTM D4491 Test Methods for Water Permeability of Geotextiles by Permittivity

ASTM D4533 Test Method for Trapezoid Tearing Strength of Geotextiles

ASTM D4632 Test Method for Breaking Load and Elongation of Geotextile
(Grab Method)

ASTM D4751 Test Method for Determining the Apparent Opening Size of
a
Geotextile

ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D5261 Test Methods for Mass per Unit Area (Weight) of Woven Fabric

PART 2 - PRODUCTS

2.01 GEOTEXTILE

- A. Geotextile shall be non-woven needle-punched continuous filament, polyester or other approved polymer. Geotextile shall be resistant to petroleum products.
- B. The delivered geotextiles shall demonstrate compliance with the material property requirements presented in Table 1 of this specification section.
- C. Geotextiles and thread shall be manufactured from first quality virgin materials.

2.02 MANUFACTURE OF GEOTEXTILE

- A. All rolls of geotextile shall be identified with the manufacturer's name, product identification, lot number, roll number, and roll dimensions.
- B. Should any special handling be required, the requirements of the manufacturer shall be marked on the top surface of the geotextile packing in a conspicuous location.

TABLE 1

MINIMUM PHYSICAL PROPERTY REQUIREMENTS FOR GEOTEXTILE
(Minimum Average Roll Values, except for AOS)

<u>Fabric Property</u>	<u>Unit</u>	<u>Test Method</u>	<u>Property</u>
Fabric Weight	Oz/yd ²	ASTM D-5261	76
Grab Strength	Lbs	ASTM D-4632	200
Grab Elongation	%	ASTM D-4632	50
Trapezoid Tear Strength	Lbs	ASTM D-4533	100
Puncture Resistance	Lbs	ASTM D-4833	100
AOS	Sieve size	ASTM D-4751	70 (max size)

2.03 TRANSPORT OF GEOTEXTILE

- A. During shipment, the geotextile shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions.
- B. Upon delivery of the rolls of geotextiles, the Contractor shall ensure that geotextile rolls are handled and stored in accordance with the manufacturer's instructions so that no damage is caused to the fabric, ensuring conformance to the specifications.
- C. Transportation of the geotextile shall be the responsibility of the Contractor.

PART 3 - EXECUTION

3.01 INSTALLATION OF GEOTEXTILE

- A. The Construction Manager will examine the geotextile rolls upon delivery, and any deviation from these specifications will be reported to the Contractor. The Contractor shall make the necessary repairs or replace any damaged products delivered to the site.
- B. Upon delivery of the rolls of geotextiles, the Construction Manager may retain samples and forward them to an independent laboratory for testing to ensure conformance to the specifications. The City will be responsible for such laboratory testing costs. The Contractor shall be responsible for all costs including shipping, testing and material replacement if the City's laboratory testing results in rejection of materials and material replacement. The Contractor shall accommodate the Construction Manager completely in obtaining the City's samples.
- C. Samples shall be taken across the entire width of the roll and shall not include the first three (3) lineal feet. Unless otherwise specified, samples shall measure three feet in the roll long dimension, and removed along the entire roll width.
- D. Samples shall be taken at a minimum rate of one (1) per manufacturer's lot.
- E. All geotextiles shall be handled in such a manner as to ensure the geotextiles are not damaged in any way. Should the Contractor damage the geotextile to the extent that it is no longer usable as determined by these specifications or should laboratory testing prove the geotextile deficient, the Contractor shall replace the geotextile at his own expense.
- F. The geotextile shall be installed to the lines and grades as shown on the contract drawings and as described herein.

- G. The Contractor shall take necessary precautions to prevent damage to underlying or adjacent materials during placement of the geotextile. Should damage to underlying or adjacent materials occur due to the fault of the Contractor, the Contractor shall repair or replace such materials at his own expense.
- H. During placement of geotextiles, care shall be taken not to entrap stones, excessive moisture or foreign material below the geotextile overlaps that could hamper subsequent seaming of the geotextile.
- I. Geotextile shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 24 hours prior to placement.
- J. All geotextile shall be seamed by sewing, adhesives, fusion or other means as recommended by the manufacturer. Any sewing shall be done using polymeric thread with chemical resistance properties equal to or exceeding those of the geotextile.
- K. All seams shall be continuously seamed. Spot seaming will not be permitted. Geotextile shall be overlapped a minimum six (6) inches prior to seaming.
- L. Installed geotextiles shall not be exposed to sunlight for more than 21 days.
- M. Geotextiles shall be covered as soon as possible after approval. Subsequent material shall be carefully placed to prevent wrinkling or damage to the underlying geotextile.

3.02 REPAIR OF DAMAGED GEOTEXTILE

- A. Care shall be taken to remove any soil or other material which may have penetrated a torn geotextile.
- B. Tears or holes in the fabric shall be repaired to the satisfaction of the Construction Manager.
- C. Should a hole or tear occur, a fabric patch shall be sewn into place using a double sewn lock stitch 1/4 to 3/4 inch apart and no closer than one (1) inch from any edge.

END OF SECTION

SECTION 314116

TIGHT VERTICAL STEEL SHEET PILE

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, tools, and equipment, and install the tight vertical steel sheet piles, as required by the Contract Documents.

1.02 DEFINITIONS

- A. The term "tight" as used in this Section means watertight.
- B. The term "permanent sheeting" as used in this Section means sheeting that is required to be left in place permanently upon completion of the construction activities.
- C. The term "temporary sheeting" as used in this Section means sheeting that will be removed upon completion of the work item for which it was used.

1.03 SUBMITTALS

The following items shall be submitted to the Construction Manager for information only, in accordance with SECTION: SUBMITTALS.

- A. A detailed sheeting and bracing design, including design calculations and complete working drawings and details. The design calculations shall show lateral earth pressure, design of the sheeting and bracing system, including any tiebacks or anchors, and settlement (if any) behind the sheeting due to dewatering. All design drawings and calculations shall be reviewed and signed by a Professional Engineer who is currently registered in the State of New York and who is experienced in designing sheeting systems that are similar to those proposed for this project in material, design, and extent.
- B. A detailed sheet pile installation plan. This plan, as a minimum, shall include a description and schedule of all operations related to the installation of the sheet piles including, but not limited to the following:
 - 1. Sequencing and progression of sheet pile construction.
 - 2. A description of all equipment and materials to be used during construction of the sheeting.
- C. Certificates: Certified copies of mill test reports.

D. A copy of all daily field quality control records as outlined below in Paragraph: FIELD QUALITY CONTROL.

E. A detailed plan for removal of temporary sheeting.

1.04 APPLICABLE STANDARDS

The publications are referenced to in the text by the basic designation and shall be the latest published version.

- American Society for Testing and Materials (ASTM)

ASTM A328 Steel Sheet Piling

- American Welding Society (AWS)

Structural Welding Code - Steel

- City of New York Building Code

1.05 GENERAL DESIGN REQUIREMENTS

A. All sheet piles shall be extended a sufficient distance below the bottom of excavations to prevent heaving.

B. Where excavation is adjacent to an existing building structure, the sheeting shall be extended to such depth to prevent displacement of the soils that supports the building foundations.

1.06 QUALITY ASSURANCE

The Contractor shall have experience and a successful history in installing the specified type of sheet pile system under similar subsurface conditions.

1.07 DELIVERY AND STORAGE

Steel sheeting shall be stored in orderly groups and blocked during storage to minimize possible distortion of members. Sheeting exhibiting variations beyond mill tolerance limits shall be considered distorted and shall not be permitted to be used.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Permanent sheeting shall be new and unused, and conform to the requirements of ASTM A328.
- B. Temporary sheetings shall be new or like-new, and conform to the requirements of ASTM A328.
- C. Tiebacks and Waler Systems: if used, shall be of high-strength steel.

PART 3 - EXECUTION

3.01 GENERAL

The Contractor shall place all sheeting and bracing, which may be needed to properly and adequately support the sides of all excavations, in a safe and workman-like manner. Special precautions shall be taken where there is additional lateral pressure due to the presence of adjacent buildings or other structures. The sustaining members in the bracing system shall be designed to provide sufficient reaction against the side banks to maintain stability as well as prevent loss of ground adjacent to the excavation. Any movement or bulging which may occur shall be corrected by the Contractor. Any damage resulting from failure of sheeting, inadequate shoring, or temporary supports shall be corrected by the Contractor.

3.02 SHEET PILE INSTALLATION

- A. All sheeting shall be tight and continuous, driven vertically in place by means of steam, vibratory, or pneumatic hammers. Sheet piling shall be driven in a manner which will not cause serious damage or distortion of the piles. A protective cap shall be used if required to prevent damage to the tops of the piles. The pile hammer shall be kept in proper alignment during driving by means of suitable leads or guides. The Contractor shall avoid damaging piles by overdriving. Any piling which at any time during the Contract period becomes damaged, distorted, displaced or otherwise separated from adjacent piles, shall be removed and replaced by the Contractor. Any subsurface material which prevents successful driving of sheet piling shall be removed by the Contractor.
- B. All sheeting shall be constructed in accordance with approved installation plan. Each pile shall be installed vertically and shall be properly interlocked with adjacent piles for its entire length. Vertical alignment of each pile or pile group shall be maintained within 20 percent of its length driven below grade.

- C. Welding: All necessary welding shall be done in accordance with requirements of the American Welding Society Code.
- D. Steel sheet piles shall be left in place unless otherwise specified on the Contract Drawings. Steel sheeting to be left in place shall be cut off 2 feet below final grade. Cut off sections shall be disposed of by the Contractor.
- E. The Contractor shall cut the steel sheeting as necessary to allow for the proper installation of piping and conduit.

3.03 REMOVAL OF TEMPORARY SHEETING

Upon completion of the work and after backfilling, the Contractor shall remove the temporary sheet piling. All voids caused by withdrawal of sheeting shall be immediately refilled with sand by approved ramming tools and methods especially adapted to that purpose.

3.04 FIELD QUALITY CONTROL

The Contractor shall establish and maintain a quality control program for sheet pile placing and driving operations to ensure compliance with Contract requirements. The Contractor shall maintain records of his quality control for all sheet pile construction operations, including, but not limited to, the following:

- A. Placing: The Contractor shall document the vertical and horizontal alignment, and the spacing of sheeting.
- B. Driving: The Contractor shall record the penetration into existing ground of every sheeting if driven singly, or every group of sheeting if multiple sheets are driven at one time. The records shall include driving equipment, the blow count per foot of penetration, location of the sheeting, elevation of existing grade, actual depth of penetration, and other pertinent data.

END OF SECTION

SECTION 316216

STEEL PILES

PART 1 - GENERAL

1.0 REFERENCES

- A. Bidding and contract requirements and division 1 – general requirements shall be included and made a part of this Section.
- B. Examine all Drawings and all others Sections of Specifications for requirements therein affecting the work of this Section.
- C. No change in contract price shall be due for any variation in pile footage. The contractor is completely responsible for estimating the pile lengths required to properly install the piles to correct driving resistance, while also meeting the minimum embedment into good material.

1.1 WORK INCLUDED

- A. Furnish all materials, equipment, and labor, and perform all operations required to install steel H-piles as shown on the Drawing, as specified in this Section, and as evidently necessary to complete the work within the specifications in the Contract. All work, installation, and procedures shall be per the New York City Building Code.
- B. The work under this Section includes the following:
 - 1. Furnish and drive steel piles, 10" deep minimum, ASTM A36, minimum.
 - 2. Furnish and install splices as specified.
 - 3. Perform surveying to stake pile locations and mark cut-off elevations.
 - 4. Make pile cut-offs.
 - 5. Remove or penetrate obstructions to pile installation.
 - 6. Provide assistance as required to personnel performing inspection and testing of the work.
 - 7. Perform as-built survey of pile locations and cut-off elevations.
 - 8. Load Testing
 - 9. Provide a vibration monitoring program at the existing tunnel and adjacent structures.

1.2 WORK NOT INCLUDED

- A. Inspection of pile installation and preparation of piles and driving logs will be performed by the Owner's Representative.
- B. Monitoring of dynamic pile load tests and preparation of pile load test reports will be performed by a testing agency retained by the Owner.

1.3 RELATED WORK

- A. Coordinate work with that of all other trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work.
- B. Related Sections include:
 - 1. Section 310000 – Earthwork
 - 2. Section 033000 – Cast-in-place Concrete
 - 3. Section 051223 – Structural Steel

1.4 UNIT PRICES

- A. The lump sum price provided in the proposal for furnishing and installing piles include the following:
 - 1. Furnishing and installing the total number of piles shown on the Drawings.
 - 2. Installing the estimated total linear feet of piling. Individual pile length shall be assumed to be 65' for the purpose of establishing "Add" and "Deduct" unit pricing.
- B. The following operations shall be considered as incidental to the work, and no additional compensation will be allowed for these items:
 - 1. Backhoe excavation, spudding, pre-auguring or other methods required to penetrate obstructions.
 - 2. Furnishing and installing pile splices.
 - 3. Re-driving piles due to heave.
 - 4. Surveying work and preparation of as-built plans.
 - 5. Mobilization, demobilization, and moving setting-up rigs at each pile location.
- C. Pile lengths will be measured from tip elevation to cut-off elevation. Measurement for payment for piles partially driven and removed or abandoned because of obstruction, or otherwise not due to fault of the Contractor will be from tip elevation to ground surface elevation.
- D. "Add" and "deduct" unit price per linear foot shall be included in the Proposal, and will be applied to adjust for the net difference, either more or less, between the total linear feet of piling actually measured in-place and the estimated total linear feet.
- E. "Add" and "deduct" unit prices for making pile cut-offs shall be included in the Proposal, and will be applied to adjust for the net difference, either more or less, between the actual number of cut-offs made and the number of piles shown on the Drawings.

1.5 CODES AND STANDARDS

- A. The provisions of the New York City Building Code relating to Pile Foundations shall in general govern the work of this Section, except that where more severe requirements than those contained in the Code are given in this section, the more stringent requirements shall govern.
- B. Latest editions or revisions of the following codes and standards as of the effective date of the Contract shall govern work under this Section, except that where requirements indicated on the Drawings or Specified herein differ from the codes and standards, the more stringent requirements shall govern:
 - 1. American Society for Testing Materials (ASTM):
 - a. ASTM D1143 Piles Under Static Axial Compressive Load.
 - b. ASTM D3689 Individual Piles Under Static Axial Tensile Load.
 - c. ASTM D3966 Piles Under Lateral Loads.
 - 2. American Welding Society (AWS):
 - a. Occupational Safety and Health Standards, Title 29-Labor, Part 1910.
 - b. Safety and Health Regulations for Construction, 29CFR, Part 1926.

1.6 SUBMITTALS

- A. Submit the Piling Contractor's qualifications and experience record for review and approval.
- B. Submit the following items prior to beginning work:
 - 1. Pile Type
 - a. Prior to commencement of Work, submit (9) signed and sealed copies of shop drawings and calculations by a New York State Licensed Professional Engineer with full descriptive data and design on the piles to be installed, for review and approval, including but not limited to the following:
 - 1) Pile material, diameter and wall thicknesses
 - 2) Name of pile supplier
 - 3) Pile driving equipment, including hammer and cushion block
 - 4) Pile closure plate
 - 5) Method of splicing pile
 - 2. Pile Identification Plan
 - a. Prior to commencement of work, submit in accordance with paragraph 27-688(a) of the New York City Building Code a plan showing the designation of all piles by an identifying system to the Engineer of Record for review and approval. The sheet size shall be equal to that of the Drawings.
 - b. The plan shall include the location of the centerline of each pile group by a coordinate system from a selected base reference axes. It shall incorporate the column grid identification system shown on the Drawings and the pile cut-off elevations.
 - c. After approval, submit nine copies, three of which have been sealed and signed by the Licensed Land Surveyor who will be performing the survey work, for filing with the Building Department.
 - 3. Partial Surveys: Submit partial pile surveys to the Engineer of Record periodically during pile driving operations to facilitate corrective design measures.
 - 4. Final Submittals: Location Survey and Reports
 - a. Upon completion and approval of all pile driving, submit original location survey tracing to the Engineer of Record showing location of all piles, including obstructed, damaged, and compensating piles, indicating their centerline deviation from their contract location. Provide pile-driving reports, which include deviations, depth of pile, and cutoff elevations.
 - b. Include nine copies, three of which have been sealed and signed with original signature by the Licensed Land Surveyor, for filing in the Building Department. Reports shall be signed by the Engineer designated for Controlled Inspection.
 - c. Load Tests: If load test are required per paragraph 3.09A of this Section, submit load test reports to the Engineer of Record. Submit nine copies of each, three of which have been sealed and signed with original signature by a Licensed Professional Engineer, for filing in the Building Department.

In addition, Pile Load tests and monitoring shall be performed as indicated in the Geotechnical report and recommendations, prepared by Future Tech Consultants, Dated January 27, 2006, December 20, 2006, and August 10, 2007.

- 5. Quality Control Submittals

1. Existing Conditions Survey:

- a. Provide copies of all photographs required to be taken under the General Conditions to the Authority's field representative. Coordinate with the Earthwork Section.
 - b. Provide copies of survey logs and benchmarks required to be taken under the General Conditions to the Authority's field representative. Coordinate with the Earthwork Section.
6. Detailed description of installation equipment and installation procedures to be used, including data on the hammer, cushion, and driving head proposed for use.
 7. Number of driving rigs to be furnished and proposed driving schedule and installation sequence.
 8. Mill certificates for steel H-pile. If not available, cut coupons from the steel, have tension tests performed by a certified testing laboratory in accordance with ASTM A252 procedures, and submit the test results.
 9. Welder certifications.

1.7 PROJECT RECORD DOCUMENTS

- A. The installed location, tip elevation, and top elevation of each pile shall be established by a Licensed Surveyor engaged by the Contractor:
 1. Submit drawings showing as-built locations as the job progresses. In order to expedite approval of the pile cap work, drawings shall be submitted within 2 days after installation of all piles within a pile cap. Drawings shall show:
 - a. Each pile identified by location and number.
 - b. Pile tip elevation.
 - c. Pile cut-off elevation and deviation from specified elevation.
 - d. Deviation from specified location measured to nearest 1/4 inch, and the direction of the deviation.
 2. Upon completion of all pile driving, submit composite as-built drawings having the same scale as the Contract Drawings, showing installed locations of all piles including obstructed, damaged, and compensating piles.
- B. The Owner's Representative will prepare a log for each pile installed, and the Contractor shall cooperate with and assist the Owner's Representative in obtaining the required data. Each log shall indicate name of Owner and Project, name of Contractor, name and signature of the Owner's Representative witnessing the installation, and the following data:
 1. Pile location and pile number.
 2. Date and time of installation, and the total driving time.
 3. Hammer make, model, energy rating, stroke, and rate of operation.
 4. Depth and diameter of any pre-auguring.
 5. Pile size, length installed, tip elevation, and cut-off elevation.
 6. Location of any splices.
 7. Driving resistance record of the pile measured in blows per foot.
 8. Any observations of damage of the pile, unusual or erratic hammer behavior, pile heave measurements, or other pertinent information.
 9. Hammer type and size.
 10. Hammer speed.
 11. Observations on alignment of pile.

1.8 QUALITY ASSURANCE

- A. Control the quality of materials and services to meet the requirements specified herein and on the Drawings.
- B. Piling Contractor shall have a minimum of five years documented experience in the installation of concrete filled steel pipe piles.
- C. An experienced pile driving supervisor shall be on the job site at all times during progress of the work.
- D. All required shop and field welding, qualification of welding procedures, and qualification of welders shall be in accordance with AWS D1.1 and the New York City Building
- E. All work shall conform to OSHA regulations and to the requirements of the Building Code of the City of New York.
- F. Attend a pre-installation conference to be held prior to commencing work of this Section.
- G. Load test procedures shall be supervised by a Professional Engineer licensed in the State of New York specializing in pile design engaged by the contractor.

1.9 SITE CONDITIONS

- A. A Geotechnical Investigation and additional recommendations has been performed for this project by Future Tech Consultants of New York, Inc. A copy of the report and recommendations of this investigation is included with the Contract Documents for the Contractor's use in assessing driving conditions. Immediately report to the Construction Manager any significant variations between soil or groundwater conditions described in the report and those encountered during construction.
- B. Visit and examine the site before submitting a proposal for the work.
- C. No claim for additional costs will be allowed because of lack of full knowledge of subsurface conditions as indicated in the report of the Geotechnical Investigation, or of surface and overhead conditions readily apparent from a careful examination of the site.
- D. Conform to local noise abatement ordinances.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Unload steel H-piles in a controlled manner to prevent damage.
- B. Store on adequate blocking off the ground.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Piles shall be Friction Piles of 30 Ton capacity. Piles shall be steel H Piles.
- B. Steel H Piles: Steel – ASTM A36 use a cast or structural steel driving head. Piles shall be driven in a single length. Blow count in the final 3'-0" of driving shall be as directed by Project Geotechnical Engineer.

C. Splices:

1. Make full penetration groove weld along the full width of each flange and a fillet weld at the remaining corners.
2. The number of splices used shall be kept to a minimum. No splices shall be used in the upper 10 feet of the pile.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect piles upon delivery to the site. Piles determined damaged shall be rejected and removed from the site.

3.2 PREPARATION

- A. It shall be Subcontractor's responsibility to furnish the specified type of pile and to install a satisfactory pile foundation.
- B. Survey: Registered Professional Land Surveyor or Registered Civil Engineer, specified in Section 011100, GENERAL REQUIREMENTS, shall establish lines and levels and stake pile locations.
 1. After all piles are driven; Registered Professional Land Surveyor or Registered Civil Engineer shall make field survey of completed piling work. Submit drawing to owner showing actual pile locations with respect to planned pile locations and indicating plumbness of piles.
 2. Mark each pile with clearly visible interval lines. Starting at the pile tip, space the lines at five-foot intervals for the first 10 feet and at one-foot intervals thereafter. Write the numerical footage from the tip at 5-foot intervals.
- C. Reports: Submit a report in quadruplicate to Owner, for each pile, detailing diameter or cross section, length, make and model of hammer, driving time, blows per minute, number of blows per foot in last 5 feet of penetration, number of blows for each inch during final 6 inches of penetration, and any other pertinent information.
- D. Welding (Shop and Field): Qualification for welding procedures, welders, and operators shall comply with requirements of AWS D1.1. Contractor shall keep records of test results of welding procedures and submit copies of each qualified welding operator to Owner for approval before starting welding.
- E. Protection of Existing Tunnel and Adjacent Structures:
 1. The contractor shall exercise extreme care to protect the existing underground steam tunnel that runs beneath the site. Crane or other heavy machinery should stay away from the tunnel a distance beyond the influence line of the tunnel or at least 10 feet, whichever is greater, or as directed by the project geotechnical engineer. No crane or heavy machinery is allowed to cross over the tunnel.
 2. Vibration monitoring units should be placed inside existing tunnel and adjacent structures during the entire course of pile driving. Should Peak Particle Velocity (PPV) recorded in the unit exceed 0.5 inches per second, or damages be found during and immediately after the test pile driving, cease the driving operation and report results to project engineers for review and determination.

F. Protection of Existing Facilities:

1. Field-verify locations of known or suspected underground utilities and the existing tunnel shown on the Drawings or reported by the Owner.
2. When driving piles near or adjacent to existing utilities or structures, special consideration shall be given to all aspects of the installation procedure including the sequence of driving in order to minimize the effects of heave and vibration on the existing structures. The proposed sequence of driving shall be approved. Perform pre-auguring in advance of pile driving where determined necessary to minimize lateral soil pressure on underground utilities or buried structures, including the tunnel.
3. Notify the Construction Manager immediately if unknown underground utilities are encountered or damaged.
4. Do not drive piles within 50 feet of a concrete structure in which the concrete is less than 3 days old, unless approved writing.

3.3 INSTALLATION

A. Driving Equipment:

1. Select and furnish pile-driving equipment capable of installing the piles in their proper position and alignment and to the designated bearing stratum. Submit description of equipment and obtain approval from the Construction Manager before the work is started. Minimum requirements for driving equipment are as follows.
2. Use a single acting air or steam hammer for driving the piles. The hammer shall be capable of delivering a minimum energy of not less than 15,000 ft-lbs. per blow as rated by the hammer manufacturer.
3. Driving shall be done with fixed leads and driving head which properly fits the pile being driven and which will hold the pile in position and in axial alignment with the hammer. Leads shall be sufficient length so that the use of a follower will not be necessary. Suitable anvils cushion and driving heads shall be used to prevent damage to the pile heads. The cushion used shall provide enough protection to prevent damage to the pile and equipment, but shall not absorb so much of the energy that the pile cannot be driven to satisfactory bearing.
4. The Contractor shall demonstrate to the satisfaction of the Owner's Representative that the hammer is operating efficiently and in accordance with the hammer manufacturer's specifications and operating instructions.
5. If in the opinion of the Engineer, the hammer operating properly or delivering the a minimum of 15,000 foot pounds of the rated energy, the Owner shall make arrangements for and pay the costs for a specialist engineering testing company to conduct dynamic testing of piles in accordance with ASTM D4945.
6. This testing shall be done one test pile driven with each piling hammer as directed by the Owner's Representative. Additionally, the Owner's Representative may instruct the Contractor to test piles during the course of the work if significant changes have been made in the driving system or if the piling hammer appears to be functioning improperly.
7. The Contractor shall modify the pile driving system or replace the piling hammer if test results show that the energy transferred to the upper part of the pile is less than 50 percent of the rated hammer energy at the time the pile is being driven to the required final resistance, or if it is significantly less than the amount measured for load test piles in that area.
8. Drive foundation Piles to depth as directed by Geotechnical Engineer.
9. Make no penetration measurements for purpose of determine resistance to driving when pile heads are damaged to extent that may effect measured penetration nor immediately after a fresh cushion block has been inserted under striking part of hammer. Make measurements with minimum interruption of driving.

B. Pile Driving Criteria:

1. All piles shall be driven through the strata below as shown in the soil test boring logs and Geotechnical Report for this site. They shall be driven plumb, accurate as to location and alignment, and to the minimum final resistance given herein, as shown on the drawings or as directed. Pile heads, which deform during driving, shall be cut off with a square cut perpendicular to the axis of the pile before driving may proceed.
2. The piles shall be driven continuously with the hammer specified into the bearing stratum, achieving an ultimate bearing capacity of 30 tons, per the NYC Building Code and Engineering News Record Pile Driving Formula.
3. If driving must be interrupted, upon continuation the pile shall be driven at least an additional two feet before taking measurements to satisfy the resistance criteria.
4. Make measurements during the initial pile installation work, by methods to be agreed upon the Contractor and Owner's Representative to determine whether driven piles have been lifted from their original tip elevations due to subsequent installation of adjacent piles. Provide the necessary survey tools and labor to make these measurements:
 - a. If no heave is detected in the initial one hundred piles installed, the measurements may be discontinued. Upward movement exceeding 1/4 inch shall be considered a heave.
 - b. If heave is detected, the measurements shall continue throughout the work. Re-drive all heaved piles below the original tip elevation and to the required driving resistance.
5. For additional criteria regarding installation adjacent to existing tunnel, see the Geotechnical report and recommendations.

C. Cut off piles after driving has been completed in the surrounding areas, piles shall be accurately cut-off perpendicular to the pile axis at the elevations shown on the Drawings.

D. Obstructions to Driving:

1. In parts of the site, construction debris, boulders or other obstructions may be encountered in soil above the accepted bearing stratum making it difficult to drive piles to proper bearing strata. If observations occur within the upper ten feet, they shall be removed by means of backhoe excavation and the hole subsequently refilled with material free of obstructions. Care shall be taken not to undermine adjacent structures or utilities. If encountered at depths greater than four feet, the Contractor shall resort to spudding or to other means of overcoming the obstruction or the pile or piles shall be abandoned as directed by the Construction Manager.
2. The Contractor shall have on hand suitable equipment for spudding through buried timber, cribbing, construction debris and similar obstructions and shall employ this equipment, when directed, in a manner satisfactory to the Construction Manager.

E. Tolerances for Piles:

1. Location at Top - 3 inches
2. Cut-off Elevation - 1 inch
3. Alignment - 2 percent of pile length
4. Sharp dogleg bends in pipe piles are not acceptable, and such piles will be rejected.

F. Inspection:

1. The Owner shall engage and pay for the services of a licensed professional engineer or inspection agency for a controlled inspection of the of the pile installation as per New York City Building Code.

2. Copies of all pile logs will be furnished to the Contractor and Construction Manager, and Engineer.

3.4 CORRECTIVE MEASURES FOR DAMAGED, MISS-LOCATED, OR MISALIGN PILES

- A. No forms for any pile cap shall be placed until the specified pile location survey for the pile cap has been submitted, analyzed by the Engineer, and permission to proceed with form work is given by the Construction Manager.
- B. The Engineer will make an analysis of as-built conditions at each pile cap location and will determine corrective measures required, if any, to keep pile loads within the allowable limits specified by the Building Code. Corrective measures shall be performed by the Contractor, and may include both driving additional piles and the modification of pile cap details. Any rejected piles shall be cut-off at a suitable elevation and abandoned.
- C. No additional payment will be made for corrective measures made necessary by any of the following causes:
 1. Piles rejected due to material defects or inadequate welding at splices.
 2. Piles damaged by improper installation not in accordance with these specifications.
 3. Piles damaged after installation by Contractor's construction activities, including placing and compaction of backfill.
 4. Piles driven outside of specified location or alignment tolerances due to faulty survey or installation techniques.
- D. All redesign, analysis, investigation, review and any other related work by the Structural Engineer or the Geotechnical Engineer necessitated by the Contractor's proposals, or work, or failure to perform as specified herein, the cost of which is specified herein as the Contractor's responsibility, shall be paid to the Structural Engineer and the Geotechnical Engineer at the rate of 2.5 times direct personnel expense for all personnel, plus computer costs and any other incurred expenses, with 30 days after receipt of the Engineer's invoice for such services.

3.5 FIELD QUALITY CONTROL

- A. The Owner's Representative will be the final authority with respect to the installation of piles. The authority of the Owner's Representative to approve or disapprove includes, but is not limited to, the following items:
 1. Pile hammer and cushion.
 2. Acceptance or rejection of damaged piles, or miss-located piles.
 3. Driven length and final driving resistance of piles.
- B. No piles shall be driven without the Owner's Representative being present.

3.6 CLEAN-UP

- A. During progress of the work, keep the premises in a neat and orderly condition free from accumulation of debris.
- B. Upon completion of the work, remove from the site all tools, equipment, blocking, scaffolding, temporary structures, and surplus materials, including all cut-off pile pieces and trash.

END OF SECTION

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SECTION 321216
ASPHALT PAVEMENT

DIVISION 2

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: This work includes but is not limited to the following:
 - 1. Supply and installation of asphalt paving.
 - 2. Painted lines at asphalt pavement.
 - 3. Supply and installation of crushed stone base course
- B. Related work specified elsewhere:
 - 1. Cast In Place Concrete : Section 033000

1.02 SUBMITTALS

- A. Submittals required:
 - 1. Design mixes for asphalt top course and base course, including mechanical sieve analysis.
 - 2. Mechanical sieve analysis for crushed stone base course material.

1.03 PRODUCT HANDLING

- A. Protect aggregates and masonry materials during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

1.04 WEATHER LIMITATIONS

- A. No asphalt shall be mixed or placed when air temperatures are below 45 deg. F. or above 95 deg. F.
- B. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace masonry work damaged by frost or freezing.

PART 2 - PRODUCTS

2.01 ASPHALT TOP COURSE

- A. Asphalt top course shall consist of graded aggregates and hot asphalt, plant-mixed at an approved plant. Asphalt shall conform to the requirements of New York State D.O.T. Type 6F Top Course.

- B. The composition of the mix shall conform to the following gradations:

U.S. Sieve Size	Percent Passing By Weight
1"	100
1/2"	90 - 100
1/4"	65 - 85
1/8"	36 - 65
#20	15 - 39
#40	8 - 27
#80	4-16
#200	2 - 6
Asphalt (AC-20)	5.8 - 7.0

2.02 ASPHALT BASE COURSE

- A. Asphalt base course shall consist of graded aggregates and hot asphalt, plant-mixed at an approved plant. Asphalt shall conform to the requirements of New York State D.O.T. Type 2 Base Course.
- B. The composition of the mix shall conform to the following gradations:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1 1/2"	75-100
1"	55-80
1/2"	23-42
1/4"	5-20
1/8"	2-15
Asphalt (AC-20)	2.5-4.5

2.03 PAINTED LINES AT ASPHALT PAVEMENT

- A. Pavement marking paint shall conform to New York State D.O.T. Specifications, Section 727-03 White Pavement Marking Paint Type I, and Section 727-04 Yellow Pavement Marking Paint Type I. Paint shall be 30 minute dry traffic paint.

2.04 CRUSHED STONE BASE COURSE

- A. Crushed stone shall conform to the following gradations, equal to New York State D.O.T. Type 2 base course:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1/4"	25 - 60
#40	5 - 40
#200	0 - 10

PART 3 - EXECUTION

3.01 PREPARATION

- A. Fine-grade all areas to receive asphalt and compact with a self-propelling roller weighing not less than ten (10) tons. All hollows and depressions which develop under rolling shall be filled with clean soil fill.
- B. The excavation shall be completely cleared of all debris and undesirable material. The excavation shall not be muddy, waterlogged, or otherwise unsatisfactory when the crushed stone or asphalt is placed upon it. If the excavation becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.

3.02 BASE COURSE

- A. Crushed stone base course material shall be evenly spread on the prepared excavation in the position shown on the plans or directed by the Landscape Architect, in four inch (4") layers, each layer to be rolled while wet with a seven (7) to twelve (12) ton tandem roller to the thickness shown on the drawings or directed by the Landscape Architect.
- B. Tack Coat : Before placing asphalt mixtures, the surfaces of all curbs, walls, manholes, catch basins, or other structures which shall be in contact with the finished pavement shall be painted with one thin uniform coat of asphalt tack coat.

3.03 INSTALLATION

- A. Asphalt binder course and top course shall be installed to thicknesses shown on drawings. All placement shall be in conformance with New York State D.O.T. Specifications, Section 401-3
- B. The temperature of the asphalt plant-mix when delivered to the site shall conform to the following table, with a tolerance of plus or minus 20EF:

Air Temperature	Plant-Mix Delivery Temperature
35EF	300EF
40EF	290EF
65EF	280EF
90EF	275EF

- C. Base course shall be placed over the crushed stone base and compacted with well-balanced self-propelled roller weighing 8 to 10 tons, producing a minimum of 250 pounds per inch of tread compaction. In locations not accessible to a roller, the mixture shall be compacted with mechanical tampers. After compaction the surface of the base course shall be smooth and true to line and grade.
- D. Before placing the top course the surface of the base course shall be thoroughly cleaned of all loose or deleterious material. The surface shall be thoroughly dry, and tack coat shall be applied to completely cover surface, at a rate of 0.03 - 0.07 gallons of tack coat per square yard.
- E. Top course shall be immediately placed over the tack coat. The top course shall be

compacted to thickness shown on drawings using self-propelled roller or mechanical tamper as described above. Surface of top course shall be smoothly graded, true to the required slope, pitch and grade with no variations greater than 1/8 inch along a ten-foot straight edge in any direction.

- F. Any areas found to be excessively uneven or which retain standing water shall be brought to the correct line and grade at no additional cost to the Owner.

3.04 PAINTED LINES AT ASPHALT PAVEMENT

- A. Apply painted lines where shown on the drawings. Lines shall be solid, four (4) inches wide, straight and true.
- B. Asphalt pavement shall be installed at least 48 hours before application of painted lines, and surface shall be thoroughly clean before painting.

3.05 CLEAN-UP

- A. After completion of the work, Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Landscape Architect.

END OF SECTION

SECTION 321313

CONCRETE PAVING & CURBS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be accordance with the requirements of the contract documents.

1.03 SECTION INCLUDES

- A. Work included: This work includes but is not limited to the following:
 - 1. Supply and installation of reinforced concrete pavement at sidewalk.
 - 2. Supply and installation of concrete curbs as shown on the drawings.
 - 3. Supply and installation of granite block curbs as shown on the drawings.
 - 4. Supply and installation of crushed stone base course.
 - 5. Supply and installation of reinforcing bars and fabric, and expansion joint materials, as shown on the drawings.

1.03 RELATED WORK

- A. Earthwork. – Section 310000
- B. Cast In Place Concrete - Section 033000

1.04 SUBMITTALS

- A. All submittals shall conform to the requirements specified in the General Conditions.
- B. Submittals required:
 - 1. Design mix for concrete pavement material, including proportions of aggregates by weight, slump, water/cement ratio, and percentage of air.
 - 2. Mechanical sieve analysis for crushed stone base course material.
 - 3. Manufacturer data for sealants including full color range available.
 - 4. Manufacturer data for mortar including full color range available.
- C. Product Data and Test Reports: Provide testing laboratory data to indicate that the materials delivered meet compressive strength for compressive strength and water absorption.
 - 1. Concrete Materials:
 - 2. Concrete design mix, including cement brand, proportion of aggregate by weight, slump, water-cement ratio, and percentage of air.
 - a. Sieve analysis and organic content of aggregates.
 - b. Manufacturer's data for admixtures.
 - c. Manufacturer's data for reinforcement materials.
 - d. Manufacturer's data for expansion joint materials.
 - e. Mortar Mixes.
- D. Samples: Submit samples of:
 - 1. Granite Block Curb samples of sufficient quantity to show full color range. Material used in

- the work shall conform to approve samples.
- 2. Samples of mortar colors.

E. Test Panels / Mock-ups:

- 1. Lay one test panel, not less than 5' x 5' of concrete paving for Landscape Architect's approval before commencing work. Test panel shall, at a minimum, show the finish and jointing. If required to meet Landscape Architect's approval, lay additional panels as needed.
- 2. Construct one mock-up not less than 5' long of Granite Block curbing. If required to meet Landscape Architect's approval, construct addition mock-ups as needed.

1.05 WEATHER LIMITATIONS

A. Concrete Paving:

- 1. No concrete shall be mixed or placed when air temperatures are below 45° F or above 95° F.
 - a. Comply with the Recommended practice for Hot Weather Concreting, ACI 305, and the Recommended Practice for Cold Weather Concreting, ACI 306.

B. Granite Block Curb:

- 1. Protect stonework during installation as follows:
 - a. Prevent staining of stone from mortar, grout, sealants and other sources. Immediately remove such materials from stone without damage to the latters
- 2. Cold Weather Protection: Comply with the following requirements:
 - a. Remove ice or snow formed on stonework beds by carefully applying heat until top surface is dry to the touch.
 - b. Remove stonework damaged by freezing conditions.
 - c. Perform the following construction procedures while stone work is progressing:
 - 1) Temperature ranges indicated apply to air temperatures existing at time of installation.
 - 2) In heating mortar materials, maintain mixing temperatures selected within 10° F (6° C); do not heat water for mortar to above 160° F (71° C)
 - 3) Mortar:
 - a) At 40° F (4.4° C) and below, produce mortar temperatures between 40° F (4.4° C) by heating mixing water and, at temperatures of 32° F (0° C) and below, sand as well. Always maintain temperature of mortar on boards above freezing.
 - b) At 25° F (-4° C) to 20° F (-7° C) heat both sides of the granite block curb under construction using salamanders or other heat sources and use windbreaks or enclosures when wind is in excess of 15 mph.
 - c) At 20° F (-7° C) and below, provide enclosure and auxiliary heat to maintain an air temperature of at least 40° F (4.4° C) for 24 hours after setting of stonework and heat stones so that they are above 20°F (-7° C) at time of installation.

- D. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds.

- 1. Remove and replace masonry work damaged by frost or freezing.

1.06 REFERENCES

- A. ASTM C615-96 - Standard Specification for Granite Dimension Stone.
- B. ASTM C270-97ae - Standard Specification for Mortar for Unit Masonry.
- C. ASTM C144-97 - Standard Specification for Aggregate for Masonry Mortar.
- D. ASTM C150-97a - Standard Specification for Portland Cement.
- E. ASTM C207-91 - Standard Specification for Hydrated Lime for Masonry Purposes.

- F. ASTM C99-87(1993)e - Standard Test Method for Modulus of Rupture of Dimension Stone.
- G. ASTM C97-96 - Standard Test Methods for Absorption & Bulk Specific Gravity of Dimension Stone.
- H. ASTM C170-90 - Standard Test Method for Compressive Strength of Dimension Stone.

1.07 QUALITY ASSURANCE

- A. Single-Source Responsibility for Stone:
Obtain stone elements of uniform quality and from one quarry for each type and finish of stone specified.
- B. Single-Source Responsibility for Mortar Materials:
Obtain mortar ingredients of uniform quality and from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.
- C. Single-Source Responsibility for Other Materials:
Obtain each type of stone accessory, sealants and other materials from one manufacturer for each product.

1.08 INSTALLER QUALIFICATION

- A. Installer shall demonstrate successful completion of stonework installations similar in material, design and extent to that indicated for this project.
- B. Submit list of at least five similar completed projects, including the following information for each project:
 - 1. Project name, address and description of work.
 - 2. Project date.
 - 3. Names and telephone numbers of Project Architect or Engineer, and Owner.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery to allow for all required fabrication and approval schedules.
- B. Deliver sealants to project site in original unopened containers with manufactures label, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- C. Deliver masonry materials to project site in undamaged condition.
- D. Store and handle stone and related materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.
 - 1. Store stone on wood skids or pallets, covered with non-staining, waterproof membrane.
 - 2. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones.
 - 3. Allow air circulation around stones.
 - 4. Store cementitious materials off the ground, under cover and in a dry location.
- E. Transport and handle stone and related materials to prevent their damage due to breakage, chipping, or other causes.
 - 1. Do not use pinch or wrecking bars.
 - 2. Lift with wide-belt-type slings where possible.
 - 3. Do not use wire rope or ropes containing tar or other substances which might cause staining.
 - 4. If required to move stone, use wood rollers with cushions at end of wood slides.
- F. Protect stonework during installation as follows:
 - 1. Prevent staining of stone from mortar, grout, sealants, and other sources.

2. Immediately remove such materials from stone without damage to latter.

PART 2 - PRODUCTS

2.01 CONCRETE PRODUCTS

- A. Cement: Shall be the same brand type and source of supply throughout. Cement shall be Portland cement, conforming to the requirements of ASTM C150, Type II (Moderate Sulfate Resistant).
- B. Fine aggregate: Shall be natural sand consisting of clean, hard, durable uncoated particles. Organic content shall be determined according to ASTM C40. Sand shall conform to the requirements and grading of ASTM C33.
- C. Coarse aggregate: Shall be crushed stone or crushed washed gravel from approved source, free of dirt and organic materials, conforming to the requirements and grading of ASTM C33.
- D. Admixtures: Shall be formulated to avoid an increase in water-cement ratio or loss of strength. The Landscape Architect shall approve each admixture.
- E. Water reducing admixture: Shall be used in all concrete and conform to the requirements of ASTM C494. Submit proposed admixture for approval.
- F. Air entraining agent: Shall conform to the requirements of ASTM C260, and shall be used in all concrete. Total air entrained in freshly mixed concrete shall be 6.0% of volume of concrete, with required strengths maintained.
- G. Water: Shall be from approved source; clean, potable, and free from oils, salt, alkali, or organic matter.
- H. Slump: Shall be a minimum of 1 ½" and a maximum of 4".

2.02 CONCRETE ACCESSORIES

- A. Reinforcing bars: Shall conform to ASTM A-615, Grade 60
- B. Welded wire fabric: Shall conform to ASTM A-82 and A-185. Splicing shall conform to the requirements of ACI 318.
- C. Expansion joint filler and sealer materials shall be as manufactured by Williams Products Inc, Troy, MI (800) 521 9594, or Nomafoam, Zebulon, NC 27597 (800) 345-7279, or Pecora Corp., Harleysville, PA 19438 (800) 523-6688.
 1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.
 2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.
 3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.
 4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.
 5. Landscape Architect shall select sealant colors from full range of colors available.

2.03 CONCRETE STRENGTHS AND PROPORTIONS

- A. All concrete shall have a minimum compressive strength at the age of 28 days of 4000 psi. Maximum aggregate size shall be ¾".
- B. Mix proportions shall be selected to produce an average strength exceeding PSI in accordance with

the provision of ACI 318, Section 4.2. The Contractor shall submit to the Landscape Architect the concrete strength to which the materials were proportioned, and copies of any records that the concrete supplier may have showing standard deviations in previous mixes.

- C. Mix proportions shall be determined in accordance with either Method 1 or Method 2 as described in ACI 301.
- D. If it is intended to place any concrete by pumping, a corresponding mix shall be designed for such placement and so designated.

2.04 CRUSHED STONE BASE COURSE

- A. Crushed stone shall conform to the following gradations, equal to New York State D.O.T. Type 4 Subbase course:

<u>U.S. Sieve Size</u>	<u>Percent Passing By Weight</u>
2"	100
1/4"	30 - 60
#40	5 - 40
#200	0 - 10

2.05 GRANITE BLOCK CURBING

- A. Granite Block: Granite block for curbing shall be Westchester Schist and shall be obtained from one quarry unless otherwise approved by the Landscape Architect. Only one stone type shall be used for the curbs throughout the project. Stone unites shall conform to the sizes shown on the drawings.
- B. Concrete base slab shall conform to Section 03300, Cast-in-Place Concrete

2.06 MORTAR FOR GRANTIE BLOCK CURBING

- C. Setting Bed:
 1. Mortar for setting bed and grouting joints shall be 3 parts sand, 1 part Portland cement with the addition of "Laticrete" #3701 mortar additive or other approved latex admixture in quantities recommended by the manufacturer. Hydrated lime may be added to mortar if compatible with latex bonding agent and with prior approval of the Landscape Architect.
 2. Coloring Agent: Mortar for grouting shall, when directed by the Landscape Architect, be integrally colored with approved pigment of not more than 2lbs per bag of cement. The Architect from the full range available by manufacturer shall select color. Final color of concrete mix shall be subject to approval by the Landscape Architect.
 3. Comply with ASTM C270, Proportion Specifications, for types of mortars and applications specified, unless otherwise indicated.

PART 3 - EXECUTION

3.01 CONCRETE PAVEMENT PREPARATION & MIXING

- A. Preparation: The excavation shall be completely cleared of all debris and undesirable material.
 1. The excavation shall not be muddy, waterlogged, or otherwise unsatisfactory when the crushed stone or concrete is placed upon it.
 2. If the excavation becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.
- B. Fine grading: Fine-grade all areas to receive concrete and compact with a self-propelling roller weighing not less than ten (10) tons.
 1. All hollows and depressions which develop under rolling shall be filled with clean soil fill.
- C. Dewatering: All concrete shall be placed in-the-dry. To this end drainage and dewatering of

excavations may be required.

1. The presence of ground water in excavations will not constitute a condition for which an increase in the contract price may be made.
2. Pumping associated with dewatering shall be discharged through hay bale filters to existing storm drain inlets as approved by the Landscape Architect, and at the Contractor's own expense.

D. Mixing: Concrete shall be ready-mixed in conformance with the requirements of ASTM C94 for measurement of materials, batching, mixing, and delivery, and shall be discharged with 90 minutes after mixing.

1. Additional water may be initially added at the site to increase the slump providing neither the maximum allowable slump or w/c ratio are exceeded.
2. Concrete which subsequently loses slump to the extent that it cannot be properly deposited and consolidated shall not be used.
3. Mixing and conveying equipment shall be thoroughly clean and free from hardened concrete and foreign materials before concrete operation is started.
4. Mixer shall produce a thoroughly mixed, uniform mass, and discharge the mixture without segregation.
5. Entire batch shall be discharged before the mixer is recharged.

3.02 CONCRETE PAVEMENT INSTALLATION

A. Base: Crushed stone base course material shall be evenly spread on the prepared excavation in the position shown on the plans or directed by the Landscape Architect, in four inch (4") layers, each layer to be rolled while wet with a seven (7) to twelve (12) ton tandem roller to the thickness shown on the drawings or directed by the Landscape Architect.

1. Base course shall be wetted immediately before concrete is placed.

B. Reinforcing: All formwork and reinforcing shall be inspected and approved by the Landscape Architect prior to the placement of any concrete.

C. Depositing: All concrete shall be deposited in accordance with ACI 304.

1. Concrete shall be conveyed from the mixer to the place of final deposit in a practically continuous flow by methods which will prevent the separation or loss of the ingredients.
2. Use of chutes longer than 10 feet must be approved before use by Landscape Architect.
3. Concrete may be pumped. Use of aluminum alloys in the pumping train is prohibited.
4. Concrete shall be placed in the forms or on grade as nearly as practicable to its final position and shall be thoroughly vibrated around all reinforcing bars and mesh to assure complete absence of voids.
5. Under no circumstances shall partially hardened concrete be placed in the work.

D. Delivery tickets: Contractor shall provide one (1) copy of delivery ticket to Landscape Architect. Tickets shall be printed, stamped, or written and contain all the information as required by ASTM C94.

E. Finish: Shall be non-slip broom finish.

1. Surface shall first be smooth float finished. Immediately following float finish surface shall be slightly roughened with fiber bristle broom, perpendicular to the main traffic flow.

3.03 CONCRETE PAVEMENT JOINTS

A. Expansion joints:

1. At concrete slabs, concrete shall be divide into panels containing a maximum of 400 square feet or as shown on the drawings. Each panel shall be separated by expansion joints.
2. Expansion joints shall be installed between new concrete pavements and all existing rigid pavements, walls, curbs, buildings or other structures.
3. Hold reinforcing materials a minimum of three (3) inches clear from all expansion joints.
4. The surface of the concrete at all expansion joints shall be thoroughly cleaned prior to placing

adjoining concrete.

- B. At expansion joints the joints shall be clean and dry and the joint filler material secured in place prior to the placing of fresh concrete.
 - 1. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.
 - 2. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.
 - 3. Sealant shall be flush with finished surface of concrete.
- C. Score joints: Within each panel, concrete shall be divided by scored control joints, located at a maximum of five (5) feet on center, or as shown on the drawings. Joint shall be tooled as shown on the drawings.

3.04 CONCRETE CURBS

- A. Install poured in place curbs as shown on the drawings
 - 1. Construct true to line and grade, with top edges matched to existing adjacent curbs.
 - 2. Install vertical expansion joints adjacent to all existing curbs, walls, buildings or other structures, and at a maximum of 25 feet on center, or as shown on the drawings.
 - 3. Hold reinforcing materials a minimum of three (3) inches clear from all expansion joints.

3.05 CONCRETE CURING & PROTECTION

- A. Concrete shall be carefully protected from the drying effects of the sun and wind, traffic, or other causes by means of suitable guards and covering, and shall be kept moist for a period of three (3) days.
- B. Concrete shall be protected against imprints or marking during the curing period. Any imperfections which occur before the concrete has set shall be repaired by the Contractor prior to final acceptance, at no additional cost to the Owner.

3.06 INSPECTION

- A. Finished surface shall be smooth, uniform and solid, with no evidence of chipping or cracking.
- B. Tolerances:
 - 1. Final thickness of top course shall not vary more than 1/4 inch from dimensions shown on the drawings.
 - 2. Final grade shall not vary more than 1/2 inch from elevations shown on the drawings.
 - 3. Grades shall be smooth between high points and low points indicated, graded for positive drainage, with no variation greater than 1/4 inch.
- C. Repairs:
 - 1. Cut out and remove all defective areas, or areas which do not meet specified tolerances, and replace with new concrete installed in conformance with these specifications.
 - 2. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.07 INSTALLATION OF STONE CURBS

- A. Preparation: Clean sub-base to remove dirt, dust, debris, and loose particles. Compact sub-base thoroughly to provide a solid foundation. Replace unsatisfactory sub-base material with broken stone or other approved material.
- B. Concrete footing or base slab: Install concrete slab in conformance with the requirements Section 03300: Cast in Place Concrete.
- C. Setting: Set stone curb on footing after concrete has set for at least 5 days.

1. Wet stone thoroughly before setting.
 2. Shim as necessary to ensure accurate vertical and horizontal position.
 3. Pour concrete haunches on back and front of curb to within 6" +/- of finished adjacent pavement surface as shown on the details.
- E. Prohibit traffic on curbs during setting or within 24 hours after setting.
- 3.08 CLEAN UP
- A. After all mortar is thoroughly set and cured, clean all stonework to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.
- B. After completion of the work, Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Landscape Architect.
- 3.09 MAINTENANCE
- A. The Contractor shall maintain all stonework during the life of this contract until final acceptance of the work, and shall repair and replace all work that are disturbed, damaged, or destroyed at no cost to the Owner.

END OF SECTION 321313

SECTION 321723

PAVEMENT MARKINGS

PART - GENERAL

SUMMARY

The work of this Section shall consist of furnishing and installing painted pavement markings, centerlines, edge-lines, painted legend, arrows and markings, of the type and color specified at the locations indicated on the Plans and in conformity with the Plans, these Specifications and as directed by the Technical Representative.

Painted legend, arrows and markings includes paint installed with a hand stripping machine such as: stop bars, crosswalks, parking stalls, and lane arrows. All painted pavement markings, with the exception of parking stalls, shall be reflectorized.

QUALITY ASSURANCE

Codes and Standards: Comply with provisions of following, except otherwise indicated:

New York State Department of Transportation (NYSDOT),
Standard Specifications for Construction and Materials.

PART - PRODUCTS

MATERIALS

Pavement Marking Paint:

Pavement markings within construction site: White, Type 1, in accordance with the Standard Specifications Section 727-03.

Reflectorized Pavement Markings in accordance with the Standard Specifications, Section 727.01.

PART - EXECUTION

CONSTRUCTION METHODS

Pavement markings shall be applied in accordance with Standard Specifications, Section 640-3 and as modified herein.

Pavement markings shall be applied in accordance with the details shown on the Plans.

The pavement surface shall be cleaned at the direction of the Technical Representative just prior to application. Pavement cleaning shall consist of at least brushing with rotary broom (non-metallic), and additionally as recommended by the material manufacturer.

END OF SECTION

SECTION 323119
STEEL FENCING & RAILINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: This work includes but is not limited to the following:
1. Fabrication and installation of steel picket fencing and gates, as shown on the drawings.
 2. Painting of all steel items.
 3. All anchors, sleeves, fasteners and incidental materials required for the complete installation of steel and fencing.
- B. Related work specified elsewhere:
1. Cast in Place Concrete - Section 033000.

1.02 SUBMITTALS

- A. Product Data:
Submit manufacturer's technical information for the following items:
1. Manufacturers information and color chart for paint..
 2. Anchors, dowels and other attachments or fasteners as required.
- B. Shop Drawings:
Submit complete and dimensioned shop drawings, showing layout and details of construction, including all sizes, materials, joints, and fastening methods. Including dimensioned locations of all anchorings. Coordinate shop drawings with stone fabricator, or others, as required for coordination of work:
1. Steel picket fence.
 2. Steel picket gates, single and double leaf gates

1.03 CODES

- A. All work shall conform to the current editions of the following standards and recommended practices, except as modified in this Specification:
1. AWS "Structural Welding Code" including all supplements, addenda and special rulings applicable to building construction.
 2. SSPC "Steel Structures Painting Manual, Volume 2, Systems and Specifications".

1.04 QUALIFICATIONS

- A. All steelwork shall be performed only by a firm specializing in such construction.

1.05 PRODUCT HANDLING

- A. Use all means necessary to protect the materials of this section before, during, and after construction.

PART 2 - PRODUCTS

2.01 CONCRETE

- A. Concrete for footings shall conform to the requirements of Section 033000 - Cast In place Concrete.

- A. Fencing and gates shall be constructed of steel bars, posts, rails and pipes of the sizes shown on the plans.
 - 1. All material shall conform to Specification C1015 of the AISI.

2.03 HARDWARE

- A. All hinges, bolts, anchors and other hardware shall be stainless steel, or as shown on the drawings.

2.05 PAINT

- A. Paint system shall be manufactured by Sherwin-Williams Company, or approved equal.
- B. Paint color for all work shall be black.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Workmanship shall be in accordance with AISC Specifications and as specified herein.
- B. Temporary bracing shall be provided wherever necessary during assembly and erection, and shall be left in place as long as required. It is the Contractor's responsibility for safe practice in this regard.
- C. Field errors and adjustment shall not be corrected by burning.

3.02 FABRICATION

- A. Fabricate all items in the shop. All steelwork shall be shop-welded and painted and, installed on site as shown on the drawings.
- B. All items shall be fabricated in strict accordance with the plans and shop drawings. Posts and rails shall be formed into panels of the shapes on the plans, and joints completely welded with welds of proper size and shape, all welds ground smooth to a neat finish. Connection shall be provided as indicated on the plans.
- C. Steel members shall be set accurately in place and shall be properly aligned.
- D. All posts and pickets shall be truly vertical; rails and bars shall be parallel to grade as shown on the plans.

3.03 WELDING

- A. Do not begin welding until joint elements are bolted or tacked in intimate contact and adjusted to dimensions with allowance for any weld shrinkage that is expected. Weld sections with low hydrogen-type electrodes. No members are to be spliced without prior review by the Architect.
- B. Welding shall be performed by operators who have been qualified within the preceding one-year period under AWS standard qualification procedure for the type of work required.
- C. All welds shall be ground smooth before painting.

3.04 PAINTING

- A. Surface preparation:

Immediately prior to painting all surfaces shall be thoroughly cleaned in accordance with SSPC-SP2, Hand Tool Cleaning, to remove all loose rust and mill scale, followed by cleaning in accordance with SSPC-SP1, Solvent Cleaning, to remove all dirt, grease and foreign matter.

- B. All steelwork shall be painted to fully cover all surfaces, edges and ends.
 - 1. All elements shall be clean and dry prior to painting.
 - 2. No painting shall be carried out during or immediately after rain or foggy weather, or when the temperature is below 50 deg. F.
- C. All steel elements shall completely painted in the shop, in complete accordance with the manufacturers instructions. Following site installation, additional finish paint shall be applied to touch-up all fastenings, scratches, or damaged areas. Paint shall be applied with brush and roller in a workmanlike manner, and thoroughly worked into the surface without fins or runs. Drop cloths shall be used to protect existing ground surfaces and adjacent appurtenances.
 - 1. First Coat: Sherwin-Williams Tile-Clad II Epoxy, to a minimum of 4 mils dry film thickness. Allow to dry for 12 hours.
 - 2. Second Coat: Sherwin-Williams Hi-Bild Aliphatic Polyurethane, to a minimum of 3 mils DFT. Allow to dry 24 hours.
 - 3. Third Coat: Sherwin-Williams Hi-Bild Aliphatic Polyurethane, to a minimum of 3 mils DFT.

3.05 INSTALLATION

- A. All steelwork shall be installed as shown on the drawings. Support all posts or other elements to hold them to line and grade, until secured in place.
- B. Any steelwork not installed to the satisfaction of the Architect shall be removed and replaced at the Contractor's expense.

3.06 CLEANING

- A. Touch-up Painting:
Immediately following installation clean all field welds, bolted connections and abraded areas of shop paint.
 - 1. Cut bolts flush with nuts and weld or peen ends.
 - 2. Touch-up paint all exposed areas, with paint to match shop painted areas.

3.07 PROTECTION

- A. Protect and maintain all steelwork during the life of the contract.
 - 1. Use temporary protective covers as required.
 - 2. Remove and dispose of covers at Substantial Completion.
 - 3. Restore, repair or replace all members that are disturbed, damaged or destroyed, so that no evidence of such correction work is visible.

END OF SECTION

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SECTION 329100

PLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This work includes all labor, materials, equipment and services necessary to complete the supply and installation of new plantings, including but not limited to the following:
 - 1. Supply and installation of new trees, shrubs and all other plant materials.
 - 2. Supply and installation of new seeded lawns.
 - 3. Supply and installation of mulch.
 - 4. Supply and installation of fertilizers and bio-stimulants.
 - 5. Protection and maintenance of all plant materials until Substantial Completion.
 - 6. Guarantee of all new plant materials for a period of 18 months.
 - 7. Maintenance of plantings during the 18 month Guarantee Period.

1.3 RELATED WORK

- A. Section 311000: Earthwork.
- B. Section 329113: Soil Mixes.

1.4 SUBMITTALS

- A. All submittals shall conform to the requirements specified in the General Conditions.
- B. Samples:
Submit samples of the following items:
 - 1. Mulch: One (1) pound bag.
- C. Product Data:
Submit manufacturers product information for the following items, showing conformance with the specified requirements:
 - 1. Filter fabric.
 - 2. Tree straps.
 - 3. Lawn seed.
 - 4. Fertilizers
 - 5. Bio-stimulants
- D. Submit analysis of each seed mix to be used, showing percentage of purity, weed content and germination of seed.
- E. Documentation:

The Contractor shall submit written documentation at least 30 days prior to scheduled start of planting that all plant material has been ordered.

F. Maintenance Program:

Submit written schedule of maintenance operations proposed for the guarantee period. Schedule shall be in the form of a list of each maintenance operation, with dates showing when each maintenance task will be performed, and the frequency of occurrence.

G. Submit a Statement of Qualifications for the Landscape Contractor.

1.5 QUALIFICATIONS

A. Statement of Qualifications shall consist of the following information:

1. Company name and address.
2. Number of years in business under this name.
3. Number of current full-time, part-time, and seasonal employees.
4. Estimated number of employees intended for this project.
5. Current workload: Name and address of current projects with estimated completion date for each current project.

B. References for three (3) projects completed within the last six (6) years, which are similar in scope to this project, including the following information for each project:

1. Name and address of Project.
2. General description of work.
3. Date landscape work was begun/completed.
4. Name, address and telephone of Project Owner.
5. Name, address and telephone of Architect, Landscape Architect or Engineer.

1.6 REFERENCES

- A. AAN: American Association of Nurserymen.
AASHTO: American Association of State Highway and Transportation Officials.
ASNS: "American Standard for Nursery Stock," ANSI Z60.1 latest edition, published by the American Association of Nurserymen, (AAN).
ASTM: American Society for Testing and Materials.
ISA: International Society of Arboriculture, Tree and Shrubs Transplanting Manual, Latest Edition.
NAA: National Arborist Association, Standards.
SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.

1.7 PLANT SELECTION AND INSPECTION

- A. Contractor shall locate all other plant materials at nursery sources within a 100 mile radius of New York City. If the Contractor is unable to locate the plant material specified at local nurseries, he shall immediately notify the Landscape Architect to discuss possible substitutions, or sources beyond the New York metropolitan region.
- B. Contractor shall be present for all inspections at the nursery and on-site. Contractor shall make all pre-selection arrangements at the nursery to ensure an efficient selection procedure, and shall verify plant material availability prior to scheduling of inspection. Notify the

Landscape Architect at least fourteen (14) days in advance of Contractor's desired inspection dates.

C. Inspection at Nursery:

All plants will be inspected and selected by the Landscape Architect at the nursery for conformity to specification requirements. If approved, such approval shall not affect the right of inspection and rejection during delivery and installation.

D. Inspection at Delivery - On Site:

Notify the Landscape Architect at least five (5) working days in advance of delivery of plants to the site. The Landscape Architect will inspect all plants upon delivery to site. Contractor shall schedule a time for on-site inspection prior to planting, and shall arrange for adequate labor and equipment on-site at the time of inspection to unload, open, and handle plants during inspection.

1. The Landscape Architect may reject any plant material prior to or upon delivery to the site.
2. All plant material which is dead, dying or appears unhealthy will be rejected.
3. All plant material which has been improperly maintained, dug, transported or handled in such a way as to impair its appearance or health will be rejected.
4. The Landscape Architect will be the sole judge of the condition of the plants.

E. All material which is rejected on-site shall be removed immediately from site, and replaced with new material selected by the Landscape Architect, at no additional cost to the Owner.

1.8 REGULATORY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary for work to comply with such requirements at no additional cost to Owner.
- B. Procure and pay for permits and licenses required for work of this Section. Obtain all required permits in a timely manner to avoid delays to the work.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials:

Deliver packaged materials in unopened bags or containers, each clearly bearing the name of the producer, the material composition, manufacturers' certified analysis, and the weight of the material.

1. All packaged products shall be stored, handled and applied in strict accordance with manufacturers instructions.

B. Dig and handle all plant material to prevent injury to trunks, branches and roots.

All plants specified as B & B (balled and burlapped) in the Plant List shall be dug with sufficient roots and shall have a solid ball of earth securely held in place by burlap and rope.

1. Do not prune prior to delivery.

2. Do not bend or bind-tie trees in such manner as to damage bark, break branches or destroy natural shape.
- C. Pack and ship all plant material to ensure arrival at site in good condition. Provide protective covering during delivery.
- D. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material, as approved by the landscape architect.
 2. Do not remove container-grown stock from containers before time of planting.
 3. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.
- E. Immediately remove rejected or damaged plant material from the site and replace with plants approved by Landscape Architect. All replacement plants shall be subject to the same requirements as the original material.

1.10 COORDINATION

- A. The Landscape Contractor shall coordinate his work with that of other Contractors. Such coordination shall include but not be limited to:
 1. Location of all underground utility lines and structures.
 2. Scheduling of planting operations.
 3. Scheduling of maintenance operations.

1.11 SUBSTANTIAL COMPLETION

- A. Contractor shall submit a written request to the Landscape Architect, for a formal inspection of the planting work for Substantial Completion.
 1. At the time of inspection all plant material must be alive, healthy, and installed as specified to be accepted.
 2. If plants are dead, dying or unhealthy, in the opinion of the Landscape Architect, or if workmanship is unacceptable, written notice will be given to the Contractor in the form of a punch list which itemizes all remedial work required for Substantial Completion.
 3. This work may include plant replacement or maintenance, and must be carried out prior to issuance of the Certificate of Substantial Completion.

1.12 GUARANTEES

- A. All new plant material and lawns shall be guaranteed for a period of eighteen (18) months, beginning at the date of issuance of the Certificate of Substantial Completion.
- B. During the eighteen month Guarantee Period the Contractor shall be responsible for all plant maintenance:

1. Contractor shall submit a written maintenance program and schedule to the Landscape Architect for approval.
2. Maintenance program shall be revised and resubmitted as required until approved by Landscape Architect.
3. During the Guarantee Period, the Contractor will maintain all plant materials as specified herein, and as noted in the approved maintenance schedule, and will replace, at no additional cost to the Owner, any and all plant material which has died or which is, in the opinion of the Landscape Architect, in unhealthy or unsightly condition.

C. Replacements:

There will be no limit to the number of times replacements are made of individual plants, unless conditions causing the failure can be proved to be beyond the control of the Contractor.

1. All replacements shall be in accordance with original Specification.
2. Cost of replacement is considered to be included in the Contract price.
3. Replace unacceptable plant material no later than the next succeeding planting season.

D. Guarantee all replaced material for a period of eighteen (18) months after the date of replacement.

1. All areas damaged or soiled by replacement planting operations are to be fully restored to their original condition at no additional cost to the Owner.

E. Vandalism:

Contractor will not be held responsible for acts of vandalism occurring after the beginning of Guarantee Period.

F. Final Acceptance:

Approximately one month prior to the expiration of the Guarantee Period, the Contractor shall arrange a site inspection by the Landscape Architect, for the purpose of final acceptance.

1. At this time the Landscape Architect will prepare a list of all remedial work required, including plant replacement or maintenance.
2. This work shall be carried out before the end of the Guarantee Period, unless weather conditions cause delays, in which case such work shall be carried out as soon as is practical.
3. Following the completion of all remedial work and replacement plantings, the Contractor shall request the Landscape Architect in writing for a formal inspection of the landscape work for Final Acceptance.
4. If replacement plantings are required, Final Acceptance will be provisional upon a final inspection at the end of the Guarantee Period for the plant replacements.

G. All of the materials and labor required for maintenance and replacements during the Guarantee Period shall be included in the Contractor's bid price.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. TREES AND SHRUBS:

1. Provide plant material to meet or exceed applicable AAN standards in all ways, in addition to other standards specified.
2. Plants shall be typical of their species or variety with normal habits of growth, in accordance with ASNS.
3. Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
 - a. Shade Trees: Single-stem trees with straight trunk, well balanced crown and intact leader in height and caliper indicated on the plant list, complying with ANSI Z60.1 for type of trees required. Provide balled and bulapped.
 - b. Multistem trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form shall be clumped, provide balled and bulapped.
 - c. Deciduous Shrubs: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub. Provide shrubs either balled and bulapped or container grown as indicated on the plant list.
 - d. Coniferous Evergreens: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1. Provided coniferous evergreen trees balled and bulapped. Provide coniferous shrubs either balled and bulapped or container grown as indicated on the plant list.
 - e. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1. Provide broadleaf evergreens either balled and bulapped or container grown as indicated on the plant list.

B. GROUND COVER PLANTS

1. General: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1
 - a. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed.
 - b. Fast-Growing Vines: Provide vines of species indicated complying with requirements in ANSI Z60.1 as follows:
 - i. Two-year plants with heavy, well-branched tops, with not less than 3 runners 18 inches or more in length, and with a vigorous well-developed root system.
 - ii. Provide field-grown vines. Vines grown in pots or other containers of adequate size and acclimated to outside conditions will also be acceptable.

C. Sources:

1. Nursery sources of supply shall have been investigated by the Contractor prior to submitting bid, to confirm that size, variety, and quantity of plant material specified on Plant List can be supplied.
2. Failure to take this precaution will not relieve the Contractor from the responsibility for furnishing and installing all plant material in strict accordance with the Contract requirements and without additional expense to the Owner.

D. All plants shall be conform to the following requirements:

1. Plants shall be true to species and cultivar specified.
2. All plant material shall be nursery grown in accordance with good horticultural practice, for at least two years under climatic conditions and soils similar to those at job site.
3. No plant material shall be collected or harvested from non-nursery areas.
4. All trees shall be freshly dug for this project.
5. All trees shall have straight trunks with leader intact, undamaged and uncut.

6. Trees with a damaged or crooked leaders, bark or abrasions, sunscald, disfiguring knots, insect damaged will not be accepted.
7. Depth of planting must be checked on all trees being tagged at the nursery. Remove all soil or other fill material above the natural point where the tree trunk begins to spread, (the flare), prior to digging and ball and burlap operations

E. Size:

1. Caliper measurement shall be taken on the trunk at 6" above the natural ground line for trees up to and including 4" in caliper, and 12" above the ground for trees greater than 4" in caliper.
2. Height and spread dimensions refer to the main body of plant, and not from branch tip to tip.
3. If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the maximum size specified.
4. Plants that meet measurements but do not possess a normal balance between height and spread shall be rejected.
5. Plants larger than specified may be used only if approved by Landscape Architect. Use of such plants shall not increase the contract price. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant.
6. Contractor shall verify that size of root ball will fit in prepared planting pits.

F. All trees shall be balled and burlapped stock (B&B), with a compact natural ball of earth, firmly wrapped and tied in burlap fabric.

1. Root ball sizes shall be in accordance with standards specified in ASNS.
2. Plants with cracked or broken rootballs will not be accepted.
3. Only natural burlap fabric shall be acceptable for balling. Plastic and other non-biodegradable fabrics will not be accepted.

2.2 TREE STAKING & GUYING MATERIALS

A. Stakes:

3-inch diameter cedar, fir, or hemlock stakes, with pointed ends. Stakes shall be straight, sound, and free from defects that may impair strength.

B. Guy Wire:

New, 12 gauge galvanized wire.

C. Tree Straps:

Tree straps shall be non-stretch nylon fabric, 1 inch wide x 24 inches long, with metal grommets at each end for attachment of guy wires. Break strength shall be 300 lbs minimum.

1. Tree strap shall be Style # 2024 Nylon Heavy Duty Tree strap, as manufactured by GCS Inc., North Wales, PA 19454. Tel. (800) 360-3584. www.treestrap.com

2.3 MULCH

- A. Mulch shall be double-shredded bark, as approved. Mulch shall be partially decomposed, dark brown in color, free from sawdust, and any material over two (2) inches in length.

- B. Mulch from trees removed from site will be acceptable for use provided it meets the requirements specified herein.

2.04 FERTILIZER FOR TREES

- A. Tree fertilizer shall be "Healthy Start 12-8-8 Macro Tabs" 21-gram tablets, as manufactured by Plant Health Care Inc., Pittsburgh, PA 15238. Tel. (800)-421-9051.

2.5 BIO-STIMULANT FOR TREES

- A. Bio-stimulant for trees shall be "Mycor Tree Saver Transplant", as manufactured by Plant Health Care Inc., Pittsburgh, PA 15238. Tel. (800) 421-9051.

2.6 FERTILIZER FOR SHRUBS, GROUND COVERS & PERENNIALS

- A. Fertilizer for shrubs and perennials shall be a combined fertilizer and bio-stimulant, consisting of a granular, organic fertilizer and soil conditioner, with beneficial mycorrhizal fungi and nitrogen-fixing, phosphorous solubilizing bacteria.
- B. Fertilizer/bio-stimulant shall be Mycor 4-7-4 + Micros Plant Saver, as manufactured by Plant Health Care Inc., Pittsburgh, PA 15238. Tel. (800)-421-9051.

2.7 FOLLOW- UP BIO-STIMULANT

- A. Follow-up Bio-Stimulant shall be PHC BioPak Water Soluble Powder, as manufactured by Plant Health Care Inc., Pittsburgh, PA 15238. Tel. (800)-421-9051.

2.8 DRAINAGE GRAVEL

- A. Drainage fill shall be clean gravel or crushed stone, free from silt and organic materials, conforming to the following requirements:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1-1/2 inch	100
1 inch	95 - 100
2 inch	45 - 65
#4	5 - 15
#16	0 - 4

2.9 FILTER FABRIC

- A. Filter fabric shall be non-woven type, as Mirafi No. 140N, or approved equal. Physical properties of the filter fabric shall conform to the following requirements:

Grab tensile strength	120 lbs min.	ASTM D4632
Grab tensile elongation	55% max.	ASTM D4632
Burst strength	210 psi min.	ASTM D3786
Trapezoid tear strength	50 lbs min.	ASTM D4533
Puncture resistance	70 lbs min.	ASTM D4833

2.10 WATER-ABSORBENT POLYMER

- A. Acceptable products:

1. Supersorb, as manufactured by Aquatrols of America, Pennsauken, NJ 08110. Tel: (800) 257-7797.
2. Terrasorb, as manufactured by Industrial Services International, Bradentown, FL 34282. Tel: (800) 277-6728.
3. Agrosoke, as manufactured by Grosoke International Inc., Fort Worth, TX 76118. Tel: (800) 522-0696.

2.11 GRASS SEED MIX

- A. Grass seed shall be fresh recleaned seed of the latest crop. Seed mixture shall have the following proportions by weight:

60% Nassau Kentucky Bluegrass
20% Jamestown Chewings Fescue
20% Palmer Perennial Ryegrass

- B. Seed shall be Tri-plex General Mix, by Lofts Seed Inc. (800) 526 3890.
- C. All seed shall be delivered in standard size bags of the vendor, showing weight, purity, and percentage of seed varieties.

2.12 WATER

- A. The Contractor shall be responsible for supplying all required water to the site at no extra cost.
- B. All work injured or damaged due to the lack of water, or the use of too much water, or contaminated water shall be the Contractor's responsibility to correct.
- C. Water shall be free from impurities injurious to vegetation.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall inspect the site before bidding to determine the characteristics of the site. It shall be the Contractor's responsibility to determine what measures may be needed to assure healthy plant growth, including:

1. Removal of unsuitable material.
2. Provision of extra planting soil mixes.
3. Addition of soil improvers.
4. Addition of drainage piping, porous fill or other materials.

- B. Drainage at tree pits and planting beds:

Check drainage at tree pits and planting beds prior to planting, by performing percolation tests (in dry weather) as follows:

1. Dig out planting hole to required depth and fill hole half full of water. Mark water level with stake.
2. Water level should decrease by a minimum of two (2) inches per hour.

3. If water does not drain adequately from plant pits, amend conditions at tree pits and planting beds as required for satisfactory drainage.
4. Obtain approval of Landscape Architect for proposed amendments.
5. Do not install plants until drainage conditions are approved by the Landscape Architect.

- C. The Contractor shall be liable for any and all damage to surrounding areas caused by planting operations and shall be required to restore or replace the damage to its original condition.

3.2 UTILITIES

- A. Contractor is responsible for determining the location of all utilities, by contacting the appropriate utility company prior to any construction.
- B. Verify that underground utilities and irrigation systems in landscape areas are in place, at proper location, tested (except final irrigation testing) and ready for use.
1. Take proper precautions so as not to disturb or damage sub-surface elements.
 2. Coordinate with other trades.
- C. Contractor is liable for any damage to such utilities during the course of construction, and is responsible for making necessary repairs to damaged utilities at his own expense.

3.3 PLANTING DATES

- A. Plant only within the following dates, weather permitting. Do not plant in times of high wind, rain, sleet or snow, or when the ground is frozen, excessively wet, or the soil is otherwise in an unsatisfactory condition for planting.
1. Planting at times other than those specified will be at the Contractor's own risk, and will not invalidate any Guarantees.

- B. B & B Deciduous trees and shrubs:

Spring: March 1 to June 15.
Fall: September 15 to December 1.

- C. B & B Evergreen trees and shrubs:

Spring: March 15 to June 15.
Fall: September 15 to December 1.

- D. The following Deciduous and Evergreen trees are considered a fall planting hazard and shall be planted during the spring season only:

Abies sp. Betula sp. Carpinus sp. Celtis sp. Cercidiphyllum sp. Cornus florida. Crataegus sp. Fagus sp. Ginkgo biloba. Halesia sp. Ilex opaca. Koelreuteria sp. Larix sp. Liquidambar styraciflua. Liriodendron tulipifera. Malus sp. Nyssa sylvatica. Ostrya virginiana. Prunus sp. Pyrus sp. Quercus sp. Salix sp. Tilia tomentosa. Tsuga sp. Zelkova sp.

- D. Container-grown perennials, vines, and ground cover plants:

Spring: March 15 to June 15.
Fall: September 15 to November 15.

- E. Seeding shall be carried out during the following dates:
Spring: April 1 to June 1.
Fall: August 15 to October 15.
- F. Seeding shall be in moderately dry to moist soil, at such times when wind does not exceed five miles per hour.

3.4 PREPARATION FOR PLANTING

- A. Planting Soil Mix materials and installation shall be as specified in Section 329113 - Soil Mixes.
- B. Exercise extreme caution during excavation to avoid damaging or interrupting existing underground utilities. Use appropriate detection equipment to locate utilities during excavation for planting.
- C. Erect barricades, warning signs, or other protective devices as may be required by local, state, or federal laws and regulations, or as directed by Landscape Architect, to protect open excavations.

3.5 PLANT INSTALLATION

- A. Do not plant until plant material has been approved by the Landscape Architect at site.
- B. Placement of Plants:
 - 1. Plants shall be set in the center of pits, plumb and straight, in accordance with the planting details, and faced to give best appearance and relationship to adjacent plants and structures.
 - 2. Plant to such depth that the finished grade level of plant, after settlement, will be the same as that at which the plant was grown.
 - 3. Trees must be planted at the depth of the flare, where roots spread from the trunk. The flare must be located and placed at the correct level before continuing planting operations.

3.6 TREE PLANTING

- A. Planting balled and burlapped trees:
 - 1. Excavate plant pits to minimum dimensions shown on the drawings. If plant pits are mechanically dug, the sides of the pit shall be broken down or roughened with a shovel or other hand tool to eliminate surface glazing.
 - 2. Remove all platforms and surplus binding from top and sides of ball.
 - 3. Position plants in center of pit, using gentle handling to avoid damage to any part of plant.
 - 4. Set plants on compacted soil, to position at the correct depth, as shown on the drawings.
 - 5. If wire baskets are used to contain the root ball, these shall be entirely removed before planting.
 - 6. Fully remove all twine, ties, and other packing materials.
 - 7. Cut and remove all burlap from the upper half of root ball.
 - 8. Fold and adjust remaining burlap to expose the maximum area of the root ball, in a manner to prevent the formation of air pockets. When directed by the Landscape Architect, the burlap shall be entirely removed.

9. If non-biodegradable wrapping is used in place of burlap, this shall be entirely removed before planting.
10. Cleanly cut off all visible broken or frayed roots.

B. Backfilling:

Fill plant pit with specified soil mix by hand, in layers of not more than six inches (6") depth, and with each layer thoroughly settled by hand tamping and with water, and free of all voids before next layer is put in place.

C. Application of Fertilizer and Bio-Stimulant at trees:

The Contractor shall provide one (1) application of Fertilizer and Bio-stimulant to all trees, during the initial planting operation of each tree.

1. Fertilizer tablets shall be applied in the quantities as follows:

Tree Rootball Diameter: Quantity of 21-Gram Tablets Required:

18" - 28"	5 Tablets
29" - 38"	6 Tablets
39" - 48"	7 Tablets
49" - 58"	8 Tablets
59" - 68"	10 Tablets
Over 69"	12 Tablets

2. Bio-stimulant shall be applied in the quantities as follows:

Tree Rootball Diameter: Quantity of 3-Ounce Packets Required:

18" - 28"	2 Packets
29" - 38"	3 Packets
39" - 48"	4 Packets
49" - 68"	5 Packets
69" - 78"	6 Packets
Over 78"	7 Packets

3. Application Method:

- a. The fertilizer and bio-stimulant shall be incorporated into the top 6" of soil mix backfill at the tree pit, as follows:
- b. Backfill plant pit to within 6" of finished grade.
- c. Evenly place the fertilizer tablets around the outside edge of the root ball.
- d. Evenly spread the contents of the bio-stimulant packets in a "doughnut shaped" ring up to 8" wide around the outside edge of the root ball.
- e. Backfill to finished grade with soil mix as specified, and mix backfill by hand to blend bio-stimulant into soil mix.
- f. Compact soil mix and water to soil saturation.

D. Saucering:

After backfilling is completed, a saucer shall be made for the retention of water around each tree, unless impracticable due to placement of tree gratings or other paving material over planted area.

1. The saucer shall be of the same diameter as that of the hole dug.
2. The lip shall be level all around and shall be at least 3 inches high.

3.7 PLANTING SHRUBS, PERENNIALS & ORNAMENTAL GRASSES

- A. All shrubs, perennials, and ornamental grasses shall be planted in continuous planting beds, not in individual pits, unless otherwise shown on the drawings.
- B. Prepare planting beds to depths as shown on the drawings, and fill with improved soil mix as specified in Section 329113 - Soil Mixes.
- C. Plant holes for container plants:
 - 1. Excavate plant holes within prepared bed, to depth of container and twice the container diameter.
- D. Plant holes for balled and burlapped plants:
 - 1. Excavate hole to twice the diameter of the rootball.
- E. Planting:
 - 1. Balled and burlapped plants: Immediately prior to planting, carefully remove all burlap, wire baskets, twine or other ties from balled and burlapped shrubs, to expose the root ball.
 - 2. Container grown plants: Immediately prior to planting, carefully remove plant from container using gentle handling to avoid damage to any part of plant.
 - 3. Keep plant roots protected from drying effects of wind and sun at all times prior to planting.
 - 4. Water or heel-in as necessary.
 - 5. If roots are loose, spread roots out evenly over a mound of soil mix.
 - 6. If roots are tight and compact, loosen by pulling gently apart. If plant roots will not separate, use a sharp tool to make vertical slits in the root ball, approximately 2" deep at three or four locations around root mass.
 - 7. Set plants on a bed of compacted soil mix as specified, so that the top of the root ball will be level with the finished surface of the soil.
- F. Backfilling:
 - 1. Fill plant pit with soil mix by hand, pushing the mix around and just over the surface of the root ball.
 - 2. Add soil mix in layers of not more than four inches (4") depth, and with each layer thoroughly settled by hand tamping and with water, and free of all voids before next layer is put in place.
- G. Application of fertilizer and bio-stimulant at planting beds:

The Contractor shall provide one (1) application of fertilizer/bio-stimulant to all plant pits, during the initial planting operations.

 - 1. Fertilizer/Bio-Stimulant shall be incorporated into the top 6" of soil mix, as per the manufacturer's directions and as follows:

<u>Plant Container Size</u>	<u>Application Rate (Per 4 Ounce Scoop):</u>
1 Gallon	One Scoop (4 ounces)
2 Gallon	One Scoop (4 ounces)

3 Gallon
5 Gallon

Two Scoops (8 ounces)
Two Scoops (8 ounces)

H. Application Method:

The fertilizer/bio-stimulant shall be incorporated into the top 6" of soil mix backfill at the plant beds, immediately following planting, as follows:

1. Backfill plant bed to within 6" of finished grade.
2. Evenly mix the fertilizer/bio-stimulant into the soil mix around each plant, following the application rates shown above.
3. Backfill to finished grade with soil mix as specified, and mix backfill by hand to blend bio-stimulant into soil mix.
4. Compact soil mix and water to soil saturation.

3.8 WATERING

A. Immediately after installation of each plant, the soil around it shall be thoroughly saturated with water.

1. Apply water slowly so as to penetrate the entire root system.
2. Watering shall continue throughout the maintenance period, as frequently as seasonal conditions require, until final acceptance of the work.
3. Contractor shall be responsible for adequate water both before and after installation of irrigation system.

3.9 MULCHING

A. After planting operations are complete all tree pits and plant bed areas shall be covered with approved mulch.

B. Mulch shall be installed at an even depth of three (3) inches.

1. Mulch shall be contained within the plant bed areas and shall not be permitted to spread onto paved areas.

3.10 STAKING & GUYING

A. All trees shall be staked, guyed and secured as shown on the drawings.

B. Stakes or anchors shall be driven into undisturbed subsoil, with no damage to rootball.

1. Trees shall stand plumb after staking.
2. Do not use tree wrap.

3.11 PRUNING

A. Perform pruning following planting, only as necessary to remove all dead wood, suckers, and broken or badly bruised branches.

B. Pruning shall be done with clean, sharp tools.

1. No leaders shall be cut.

2. Each cut shall be made carefully, at the correct location, leaving a smooth surface with no jagged edges or torn bark. The correct anatomical location is just beyond the branch collar.
3. Large or heavy limbs should be removed using three (3) cuts. The first cut undercuts the limb one or two feet from the parent branch or trunk. The second cut is top cut which is made slightly further out on the limb than the undercut. The third cut is to remove the stub.

3.12 ANTIDESICCANT SPRAYING

- A. Use antidesiccant only as approved by Landscape Architect. Approval is required for each condition of use.

3.13 PREPARATION FOR LAWN SEEDING

- A. All areas to be seeded shall be thoroughly loosened to a depth of six (6) inches and graded to true lines free from all unsightly variations, bumps, ridges or depressions.

1. All sticks, stones, roots or other objectionable material over one inch (1") in any dimension shall be removed.

- B. Provide six (6) inches of lawn soil mix in conformance with Section 329113 - Soil Mixes, spread evenly over all areas to be seeded.

1. Prepare topsoil to provide a crumbly seedbed, firm and level after tilling.

- C. At least six days prior to seeding operations, apply ground limestone and uniformly work in to top one inch of seedbed.

1. The rate of limestone application shall be dependent on the pH of the soil, as determined by chemical analysis, and shall be as follows:

<u>pH of Soil</u>	<u>Rate: lbs/1000 Square Feet</u>
5.0 to 5.5	100
5.5 to 6.0	50
6.0 to 6.8	25
over 6.8	0

- D. One day prior to seeding operations, apply commercial fertilizer and uniformly work in to top one inch of seedbed.

1. The rate of application shall be: 20 pounds / 1000 sq. ft.

- E. One day prior to seeding operations, apply superphosphate and uniformly work in to top one inch of seedbed.

1. The rate of application shall be: 40 pounds / 1000 sq. ft.

- F. On the day of seeding operations, apply water absorbent polymer and uniformly work in to top one inch of seedbed.

1. The rate of application shall be: 1 pound / 1000 sq. ft.

- G. After all materials have been worked in, firm up soil by rolling to eliminate all soft spots. Rake entire area into a crumbly state, with one inch of loose soil at the surface, using a wide-toothed rake or tine-harrow.

3.14 SEEDING OPERATIONS

- A. Apply seed with drop or cyclone spreader to uniformly cover seedbed at the following rate:
6 lbs / 1000 sq feet (equal to 260 lbs / acre)
- B. Lightly rake seed into soil, and cover entire area with salt hay, to an even thickness of one-half (2) inch.
- C. Water all seeded areas immediately following seeding.
- D. Seeded areas shall be protected during establishment.
 - 1. Any areas which fail to show growth within 3 weeks of seeding shall be immediately reseeded at no additional cost.
 - 2. Reseeding shall be carried out as many times as necessary until a uniform grass cover is established.

3.15 WATERING OF SEEDED AREAS

- A. The Contractor shall provide all labor and arrange for all watering necessary to establish acceptable grass stands.
 - 1. Begin watering immediately following installation.
 - 2. During the first four weeks after planting, in the absence of adequate rainfall, watering shall be performed up to 3 times daily or as often as necessary and in sufficient quantities to maintain moist soil to a depth of at least two inches.
 - 3. Watering shall continue throughout the contract period until Substantial Completion.
- B. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
 - 1. The Contractor shall furnish sufficient watering equipment to apply one (1) complete coverage to the lawn areas in an eight (8) hour period.

3.16 MOWING

- A. Mowing of all seeded lawn areas shall begin when lawn is firmly rooted and secure, and has reached a height of three (3) inches, and shall continue until Substantial Completion.
 - 1. Mow all grass lawn areas to maintain a grass height of between 1-1/2" and 3".

3.17 PLANT PROTECTION

- A. The Contractor shall provide at his own expense any and all protection measures necessary to protect all plants and lawn areas against damage prior to Final Acceptance of the work.

B. Removal of Temporary Protection Measures:

Any temporary protection measures employed during the construction period shall be removed prior to Substantial Completion unless otherwise directed by the Landscape Architect.

1. Any guys, wires, tree straps, rubber hose sections or stakes used for temporary bracing of trees or any tree trunk wrapping shall be removed and disposed of by the Contractor off site at his own expense at the end of the Guarantee Period, or earlier at the direction of the Landscape Architect.

3.18 PLANT MAINTENANCE

- A. Maintenance of all plant material shall begin immediately after planting, and continue until the end of the Guarantee Period, unless otherwise noted.

- B. Defective work shall be corrected as soon as possible after it becomes apparent and weather season permits. The Landscape Architect shall be the sole judge of the condition of the plants.

- C. Maintenance shall include:

1. Watering, re-planting, re-seeding, re-sodding, repair of ruts and erosion, repair of protection devices, weeding, fertilizing and mowing of lawn areas.
2. The removal of all dead, dying or unhealthy plant material, including lawns, and replacement of such material with new plants or lawn seed to meet all specifications of the original plantings.
3. The repeating of any or all phases of planting or lawn work as specified herein, or which may be required to obtain healthy plantings and a uniform, thick, and well developed stand of grass.

- D. Maintenance Program:

1. Contractor shall arrange a meeting with the Landscape Architect, and with Owner's designated maintenance personnel to review together the submitted maintenance program and any modifications required for the duration of the Guarantee Period.
2. The Contractor shall make periodic inspections, at no extra cost, during the Guarantee Period to determine what changes, if any, should be made in the maintenance program.
3. Any recommended changes shall be submitted in writing to the Landscape Architect.
4. Additional remedial work not included in the maintenance program shall be carried out by the Contractor as deficiencies are identified and reported by the Landscape Architect or designated maintenance personnel.
5. The Contractor shall replace, without cost, as soon as weather conditions permit, and within a specified planting period, all plants determined dead and/or dying by Owner's designated maintenance personnel during and at the end of the Guarantee Period.
6. Plants shall be free of dead or dying branches and shall bear foliage of normal density, size, and color.
7. Trees having lost their central leader or exhibit crown dieback at the end of the guarantee period shall be replaced.
8. Replacements shall match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Labor and all materials needed for installation of replacements shall be included in the guarantee.
9. The guarantee of all replacement plants shall extend for an additional period of eighteen (18) months from the date of their acceptance after replacement.

E. Maintenance Tasks:

Maintenance shall include, but not be limited to the following:

1. Watering: Water lawns, trees and planted areas as required. Plants shall be inspected by the Contractor for watering needs at least once each week, and watered as necessary to promote plant growth and vitality. The Contractor's responsibility for watering shall terminate at Substantial Completion.
2. Mowing: Grass height shall be maintained as specified herein. The Contractor's responsibility for mowing shall terminate at Substantial Completion.
3. Weeding: Weed to keep all lawn and planted areas weed-free throughout the Guarantee Period.
4. Mulching: Add mulch material as required to maintain mulch at specified depth.
5. Pruning: Prune trees and shrubs to remove all dead or broken branches, throughout the Guarantee Period. Prune flowering shrubs as necessary to ensure flowering. Prune hedges as required to promote dense, even growth.
6. Trimming: Cut back dead stalks, flowers and foliage from perennials in fall after the first frost. Trim or deadhead spent flower blossoms throughout the Guarantee Period.
7. Resetting: Reset plant material which has settled, to proper grade and position.
8. Anchoring: Maintain tree stakes, guys and other tree anchoring systems, including tightening, repair or replacement as required, and removal at the end of the Guarantee Period, or as directed by the Landscape Architect.
9. Rodents: Protect against and exterminate rodents, and repair of any damage caused by rodent activities.
10. Fertilizers: Apply fertilizers, pesticides and fungicides as required, or as directed by the Landscape Architect, to keep all lawns and plantings healthy and pest-free throughout the Guarantee Period.
11. Follow-up Bio-Stimulant Application: Apply follow-up applications of Bio-Stimulant to all trees, shrubs, ground covers and perennials, on the following dates:
 - a. Two months after the initial planting.
 - b. Four months after the initial planting.
 - c. Six months after the initial planting
 - d. Apply Bio-Stimulant as per manufacturer's directions and as follows:
 - e. Mix one (1) pound of Bio-Stimulant powder / 100 gallons of water.
 - f. All tree planting pits and shrub beds shall be watered with mix to thoroughly saturate soil.

3.19 CLEAN UP

- A. At the end of each workday the Contractor shall broom-clean the site, to remove all trash, debris, and loose soil materials. Store materials and equipment where directed.
- B. Immediately following the completion of planting operations, the Contractor shall remove all excess materials, stockpiles, waste material, tools and equipment, and leave the site in a clear and clean condition.
- C. Immediately remove all rejected materials from the site. All rejected materials and other waste or debris shall become the property of the Contractor, who shall legally dispose of same off-site.

END OF SECTION 329100

SECTION 329113

SOIL MIXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This work includes all labor, materials, equipment and services necessary to complete the supply and installation of soil mixes, including but not limited to the following:
 - 1. Supply of component materials and soil amendments for Soil Mixes as specified.
 - 2. Preparation and blending of Soil Mixes, as specified herein.
 - 3. Installation, placement, spreading, and fine grading of Soil Mixes, as specified herein.
 - 4. Testing of all soil component materials, soil amendment materials, and Soil Mixes, as specified herein.

1.3 RELATED WORK

- A. Section 311000: Earthwork.
- B. Section 329100: Planting.

1.4 SUBMITTALS

- A. All submittals shall be as specified in the General Conditions.
- B. Product Data:
Submit manufacturer's technical information, including application instructions where relevant, for the following items:
 - 1. Fertilizers.
 - 2. Herbicides.
 - 3. Water-absorbent polymer.
- C. Test Results - Soil Mix Components:
Submit written reports, as specified herein, for each bulk component:
 - 1. Topsoil for planting soil mix.
 - 2. Compost for planting soil mix.
 - 3. Sand for planting soil mix.
 - 4. Loam for structural soil mix.
 - 5. Crushed stone for structural soil mix.
- D. Test Results - Blended Soil Mixes:
Submit written reports, as specified herein, for each blended soil mix:
 - 1. Planting Soil Mix.
 - 2. Structural Soil Mix.

1.5 TESTING

- A. Contractor shall submit written test reports as required under Submittals herein.
1. Each test shall be carried out using the categories and sieve sizes as specified herein. Failure to include any of the required criteria will be sufficient cause for rejection of the test.
 2. Testing shall be carried out by an independent testing laboratory.
 3. All testing required by this Section, or additionally required by Landscape Architect, shall be included in the Contract price.
 4. Contractor shall be responsible for timely submittal of samples to the testing laboratory.
- B. Each test report shall include the following information:
1. Project Title.
 2. Name of Contractor.
 3. Name of material supplier.
 4. Testing Laboratory name, address and telephone number.
 5. Type of test.
 6. Date of test.
 7. Test results, including identification of deviations from acceptable ranges.
- C. Each sample shall be tested for the following:
1. Mechanical analysis:
Sieve method, using sieve sizes specified.
 2. pH.
 3. Organic matter content:
Percentage of oven-dry weight of soil, determined by loss on ignition of moisture-free sample, dried in accordance with the methods of the Association of Official Agricultural Chemists.
 4. Analysis of soluble salts:
Sodium, calcium, magnesium, sulfates, chlorides and bicarbonates, in milimhos per centimeter.
 5. Analysis of minerals:
Nitrogen, phosphorus, and potassium, in parts per million.
 6. Analysis of heavy metals:
All elements specified herein, in parts per million.
 7. Corrective recommendations for nutrients and pH.
- D. The Landscape Architect may take and analyze at any time, such additional samples of materials as deemed necessary for verification of conformance to specification requirements.
1. Contractor shall furnish samples for this purpose upon request and shall perform testing as requested at no additional cost to the Owner.
- E. No component bulk material for Soil Mix shall be used or blended into a mix, until test reports have been received and approved by the Landscape Architect.
1. As necessary, make any and all soil mix amendments and resubmit test reports indicating amendments, until approved.

1.6 REFERENCES

- A. Association of Official Agricultural Chemists.
ASTM: American Society for Testing and Materials.

1.7 REGULATORY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary for work to comply with such requirements at no additional cost to Owner.
- B. Procure and pay for all permits and licenses required for the Work of this Section.

1.8 DELIVERY AND STORAGE

- A. Conform to all governmental regulations in regard to the transportation of materials to, from, and at the job site, and secure in advance such permits as may be necessary.
- B. Packaged Materials:
Deliver packaged materials to the location where planting Soil Mix is to be blended, in unopened bags or containers, each bearing the name and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the material.
 - 1. All bags shall be protected from water and contamination with other materials.
 - 2. Retain packages for inspection by Landscape Architect.
 - 3. All packaged materials shall be stored, handled and applied in strict accordance with manufacturers instructions.
- C. Stockpiles:
 - 1. Stockpiles of on-site or off-site bulk materials and Soil Mix shall not exceed 50 cubic yards, and shall be no more than six (6) feet in height to prevent anaerobic conditions within the piles.
 - 2. All stock piled materials shall be adequately covered with tarpaulins or otherwise protected to prevent excessive water absorption and blowing by winds, until time of actual use.

PART 2 - PRODUCTS**2.1 GENERAL**

- A. Perform all required tests and submit test reports. All Soil Mix components shall be tested and approved prior to incorporation into blended Soil Mix.
- B. Provide adequate quantities of all Soil Mix materials to attain, after compaction and natural settlement, all design finished grades.

2.2 PLANTING SOIL MIX

- A. Planting Soil Mix shall consist of the following proportions by volume:

70%	topsoil
15%	compost
15%	sand
5 pounds	bonemeal per cubic yard of soil mixture.
1 pound	commercial fertilizer per cubic yard of soil mixture.
1 pound	controlled release fertilizer per cubic yard of soil mixture.
2 pounds	water absorbent polymer per cubic yard of soil mixture, or as recommended by manufacturer.
Limestone	as required for specified pH.

B. Planting Soil Mix shall conform to the following requirements:

1. Organic Matter: 4% minimum – 10% maximum.
2. pH: 6.0 - 7.0.
3. Soluble salts: Less than 2 milimhos per centimeter.
4. Macronutrients:
 - Nitrogen: 20 – 100 ppm
 - Phosphorus: 5 – 50 ppm
 - Potassium: 10 – 200 ppm
5. Secondary nutrients:
 - Calcium: 100 – 200 ppm
 - Magnesium: 10 – 180 ppm
 - Sulphur: 10 – 20 ppm
6. Micronutrients:
 - Boron: 0.05 – 0.5 ppm
 - Chlorine: 5 – 50 ppm
 - Copper: 0.001 – 0.5 ppm
 - Iron: more than 0.5 ppm
 - Manganese: more than 0.5 ppm
 - Molybdenum: less than 10 ppm
 - Zinc: 0.3 – 3 ppm

2.3 HEAVY METALS

A. Blended Soil Mixes shall be tested for heavy metal content. The total heavy metal concentration shall not exceed the following:

<u>Element</u>	<u>Maximum concentration</u> <u>parts per million</u>
Arsenic	1
Cadmium	2
Chromium	100
Copper	100
Lead	150
Mercury	0.50
Nickel	50
Selenium	25

2.4 TOPSOIL FOR PLANTING SOIL MIX

A. All topsoil shall consist of natural loam, free from subsoil.

1. It shall be removed to a depth of 12", or less if subsoil is encountered.
2. Topsoil shall be of uniform quality, free from hard clods, stiff clay, hardpan, sods, roots, chips, sticks, partially disintegrated stone, cement, ashes, paper, boards, or any other undesirable material.
3. Topsoil shall be free of any materials harmful or toxic to plant growth.

B. Topsoil shall conform to the following requirements:

1. pH: 5.5 to 7.0.
2. Organic content: 3% minimum – 10% maximum.

- C. Topsoil shall conform to the following mechanical analysis:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1"	100
1/4"	90 - 99
# 10	60 - 80
# 40	40 - 60
# 60	40 - 60
# 100	10 - 30
# 200	10 - 20

2.5 COMPOST FOR PLANTING SOIL MIX

- A. All compost shall conform to the following requirements:

1. Material shall be capable of sustaining the growth of vegetation, with no materials toxic to plant growth.
2. Material shall be derived from organic wastes such as food and agriculture residues, composted cow or other animal manures, sewage sludge or other materials that meet the specified requirements.
3. Compost shall be screened, and shall be free of viable weed seed, stones, branches, roots or wood chips, and all debris such as plastic fragments, glass, and metal fragments.
4. Material shall be composted for a minimum of 12 months.
5. Acceptable manufacturers include:

Agresource: 100 Main Street, Amesbury, MA 01913.
Phone 800-313-3320. www.agresourceinc.com

Allgro, Inc.: Liberty Lane, Hampton, NH 03842.
Phone 800-662-2440.

Long Island Compost: 400 Urban Avenue, Westbury, NY 11590.
Phone 516-334-6600.

- B. Compost shall show conformance with the following requirements:

1. pH: 6.0 to 8.0.
2. Organic content: 35% minimum.
3. Carbon/nitrogen ratio: 12:1 to 30:1.
4. Passing 1" screen: 100%

- C. Heavy metal content of compost shall not to exceed the following indicated amounts:

<u>Element</u>	<u>Maximum concentration part: per million</u>
Arsenic	1
Cadmium	2
Chromium	100
Copper	100
Lead	150
Mercury	0.50
Nickel	50
Selenium	25

2.6 SOIL AMENDMENT MATERIALS

- A. Sand:
Washed coarse grit mason sand.
- B. Bonemeal:
Shall be finely ground and have the following N-P-K (Nitrogen-Phosphorus-Potassium) analysis: 4-12-0.
- C. Commercial Fertilizer:
Shall have the following N-P-K analysis: 10-6-4.
1. A minimum of 50% of the nitrogen shall be derived from organic sources.
 2. If soil tests indicate need for a different composition, Contractor shall submit proposed alternate fertilizer for approval.
- D. Controlled-release Fertilizer:
Shall be in granular form and shall have the following N-P-K analysis: 10-6-4.
1. Fertilizer shall be as manufactured by Osmocote, or Meister.
 2. If soil tests indicate need for a different composition, Contractor shall submit proposed alternate fertilizer for approval.
- E. Limestone:
Shall be granular limestone, produced from Dolomitic limestone specifically for use in planting, with a minimum of 86% of calcium and magnesium carbonates, conforming to the following requirements:
- | <u>Sieve Size</u> | <u>Percent Passing by Weight</u> |
|-------------------|----------------------------------|
| # 10 | 100 |
| # 20 | 90 minimum |
| # 100 | 60 minimum |
- F. Water-absorbent polymer:
Acceptable products:
1. Supersorb, as manufactured by Aquatrols of America, Pennsauken, NJ 08110.
Phone 800-257-7797.
 2. Terrasorb, as manufactured by Industrial Services International, Bradentown, FL 34282.
Phone 800-277-6728.
 3. Agrosoke, as manufactured by Grosoke International Inc., Fort Worth, TX 76118.
Phone 800-522-0696.
- G. Herbicides:
Acceptable products:
1. Post-emergent herbicide:
Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166.
 2. Pre-emergent herbicide, not to be used at lawn areas or grasses:
Treflan 5G.
- H. Sulphur:
Lower pH if required, by use of horticultural elemental sulfur product.

1. Peat moss or copper sulfate may not be used to lower pH.

PART 3 - EXECUTION

3.1 INSPECTION AND COORDINATION

- A. Contractor shall inspect the site before bidding to determine the characteristics of the site in areas to be planted.
 1. Prior to construction and soil mix placement operations, the Contractor shall ascertain the location of all existing and proposed electric cables, conduits, light fixtures, irrigation, under-drainage systems and all other underground or at grade utilities, by contacting the appropriate utility company.
 2. Contractor shall take proper precautions so as not to disturb or damage any paving, planters, waterproofing, drainage or other elements.
 3. Contractor shall be liable for and all damage to such elements and utilities during the course of construction, and shall be responsible for making requisite repairs to damaged utilities at Contractor's own expense.
- B. Contractor shall be liable for any and all damage to surrounding areas caused by planting operations and shall be required to restore or replace damage areas to original conditions, to the satisfaction of the Landscape Architect.
- C. Coordination:
The Contractor shall coordinate work of this Section with other work of the Project and with work of other Contractors. Such coordination shall include but not be limited to:
 1. Location of all underground utility lines and structures.
 2. Scheduling of planting operations.
 3. Scheduling of maintenance operations.
- D. Verify that all work requiring access through or adjacent to areas where soil mixes are to be placed has been completed and no further access (other than Landscape installation) will be required. In the event that access will be required, this must be coordinated with the Landscape Architect.

3.2 WEATHER LIMITATIONS

- A. Perform both blending and site soil work only during suitable weather conditions. Do not handle, haul, place, work, disc or rototill soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

3.3 BLENDING OF PLANTING SOIL MIX

- A. Uniformly blend all ingredients as required for Planting Soil Mix, by wind rowing and/or tilling on a hard surfaced area.
 1. The components of all soil mixes shall be blended so that ingredients are thoroughly incorporated into the mixture to assure uniform distribution.
 2. Do not over-mix, mix shall remain friable and well aerated.
 3. Organic matter shall be maintained moist, not wet, during blending.
 4. Delay mixing of fertilizers if planting will not follow within a few days.

3.4 PREPARATION OF SUB-GRADE

- A. Verify as-constructed or existing sub-grade elevation and perform additional grading operations as necessary to bring the sub-grade to a true, smooth, slope parallel to the finished grade, at all areas to receive soil mixes.
- B. Any sub-grades or soils polluted by gasoline, oil, plaster, construction debris, unacceptable soils, or other substances which would render the material unsuitable for plant growth, shall be removed from the site, whether or not such pollution occurred or existed prior to or during the Contract period.
 - 1. In the event that such material is placed, this material shall be removed and replaced with approved material.
 - 2. All remedial operations associated with soil mix shall be reviewed and approved by the Landscape Architect.
 - 3. Remove all stones, large clods, lumps, brush, roots, stumps, litter, trash, and other foreign material one inch (1") or larger in any dimension.
 - 4. Dispose of all debris prior to placement of soil mixes, to legal off-site location.
- C. Spray all vegetation on sub-grade with a pre-emergent weed killer at the rate of application recommended by the manufacturer.
- D. Protect adjacent pavements, walls, utilities and other construction from damage or staining by any soil mix placement operations.

3.5 PLACEMENT OF PLANTING SOIL MIXES

- A. Do not place any muddy or wet Soil Mixes.
- B. Place and spread Soil Mix over sub-grade, to a depth sufficiently greater than the depth required for planting areas so that after settlement the completed work will conform to the lines, grades, and elevations shown or otherwise indicated.
- C. Place and spread Soil Mix over the approved sub-grade, in six (6) inch maximum lifts, and settle to eliminate air pockets and minimize settlement. Lightly scarify previously placed surfaces prior to placing subsequent lifts.
- D. Compact to not less than 90% Modified Proctor.
 - 1. Provide compaction testing to conform compliance to specified compaction density.
 - 2. Fills shall not be so compacted as to restrict the flow of air or water through the soil.
- E. After completion of compaction operations, protect the installation from contamination by toxic materials or trash, and from water containing cement, clay, silt or any other materials.

3.6 GRADING OF SOIL MIXES

- A. After settlement has occurred, add soil to maintain finished grades. If for any reason soil is left exposed for a long duration prior to planting, add soil and regrade as required.
- B. Protect placed Soil Mixes against construction activity with snow fencing or by other acceptable methods.
 - 1. Protect from the eroding effects of wind and rain with filter fabric, as necessary.

3.7 CLEAN UP

- A. At the end of each work day the Contractor shall broom-clean the site, to remove all trash, debris, and loose soil materials.
- B. Immediately following the completion of soil mix installation operations, the Contractor shall remove all excess materials, stock piles, waste material, tools and equipment, and leave the site in a clear and clean condition.
- C. All waste materials shall become the property of the Contractor, who shall legally dispose of same off-site.

END OF SECTION 329113

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Section 334113
Site Drainage Piping System

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Furnish labor, materials, equipment, services to install storm and sanitary drainage piping on site. All piping shall be installed complete with couplings, rings, collars, fittings etc., as required by the Drawings and as specified herein.

1.02 RELATED SECTIONS

- A. Site Earthwork..... Section 310000
- B. Precast Concrete Drainage Structures Section 334913.01

1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM) standards, latest editions.
- A74 Standard Specification for Cast Iron Soil Pipe and Fittings.
- C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- C443 Standard Specification for Joints for Circular Concrete Sewer and Culvert pipe, Using Rubber Gaskets.
- B. American National Standards Institute (ANSI) standards, latest editions.
- A21.4 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
- A21.10 Ductile Iron and Grey Iron Fittings, 3-Inch through 48-Inch
- A21.11 Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings
- A21.51 Ductile Iron Pipe, Centrifugally Cast, for Water

1.04 SUBMITTALS

A. Product Data

Furnish manufacturers' product data and installation instructions for the following:

1. Cast iron pipe and fittings
2. Ductile iron pipe and fittings
3. Reinforced concrete pipe and fittings

4. Non-shrink grout

B. Certificates

1. Submit certificate that tests and inspection required for D.I.P. and fittings by the ANSI Specification were performed.
2. Submit certificate stating that pipe materials and fittings meet or exceed the specified requirements.

1.05 QUALITY ASSURANCE

A. Qualifications

Company specializing in the installation of each type of pipe shall have a minimum of 2 years experience.

B. Regulatory Requirements

1. Building Code: Work of this Section within the Street Line shall conform to all requirements of the NYC Building Code. Where more severe requirements than those contained in the Building Code are given in this Section, the requirement of this Section shall govern.
2. Department of Environmental Protection (DEP): Work of this Section shall conform to all requirements of the NYC Department of Environmental Protection. Where more severe requirements than those required by the DEP are given in this Section, the requirements of this Section shall govern.
3. Licensed Master Plumber
 - a. A licensed Master Plumber is responsible for work with Iron Pipe and for all work.
 - b. Licensed Master Plumber shall be in full compliance with the Licensing and Regulatory Powers set forth in Title 26 of the Building Code, including but not limited to Articles 1 and 2 of Subchapter 2.
 - c. The Licensed Master Plumber shall file and obtain all permits required by the NYC Building Department and Department of Environmental Protection and shall call for, be present at, and supervise all tests as required by the Building Department and DEP.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material to site, undamaged and clearly identified with ANSI and/or ASTM number.
- B. Store material above ground and protect from elements. Prevent damage from stacking.

- C. Protect pipe during handling against impact shocks and free fall. Do not permit hooks to come in contact with premolded joint surfaces.
- D. Handle pipe having premolded joint rings or attached couplings so that no weight, including the weight of the pipe itself, will bear on or be supported by the jointing material. Take care to avoid dragging the spigot ring on contact with gravel, crushed stone, or other hard objects.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Extra Heavy Cast Iron Pipe (X.H.C.I.)

- 1. Cast iron pipe shall be evenly coated, cylindrical, smooth, free from all defects, of uniform thickness and weights required by the New York City rules governing Plumbing and Drainage, and shall be of the grade known in commerce as "Extra-Heavy". Each length of pipe and each fitting shall be plainly marked with the manufacturer's initials or registered trademark and with the letters "XH" to indicate "Extra-Heavy."
- 2. The markings may be cast, stenciled, or otherwise applied on the pipe so as to be clear and legible at the time of installation. The marking shall be cast on fittings and shall be located away from the spigot end so as not to interfere with proper jointing upon installation. Cast iron soil pipe and fittings shall comply with ASTM A74.
- 3. Fittings for cast iron pipes shall be extra-heavy pattern, manufactured in accordance with the current ASTM Standard and shall correspond with the pipe in all particulars.
- 4. Joints in cast iron pipes shall be caulked joints made with picked oakum and molten lead, 12 oz of which must be used for each inch in diameter of the pipes at each joint and must be poured in at one time. The lead to be used for this purpose shall be of soft "Pig" or "Bar".
- 5. After cooling and shrinking, the lead shall be thoroughly caulked and the joints made impermeable to gases and liquids and also be capable of withstanding the test applied. The face of the lead joints shall finish flush with the face of the hub and be left without putty, paints, or cement. Whenever joints are made on the floor or surface they shall be recaulked after being placed in position.

B. Ductile Iron Pipe (D.I.P.)

- 1. Ductile iron pipe shall have an outer coating of coal tar and shall comply with the requirements of ANSI A21.51. Ductile iron fittings shall have a pressure classification of at least equal to that of the pipe with which they are used. Fittings, joints, and accessories shall comply with the requirement of ANSI A21.10 and ANSI A21.11. All ductile iron pipe shall conform to latest Department of Environmental Protection, Bureau of Water Pollution Control, Division of Sewer Design Standard Specifications, Section 2.28.

2. Push-on rubber gasketed joint pipe shall be: The Super Bell-Tite Joint of Amstead Industries or the Tyton Joint of U.S. Pipe and Foundry. Push-on joint fittings shall be U.S. Pipe's Tyton Fittings. Pipe shall be Thickness Class 56 for all sizes of pipe.
3. In addition to the weight and class and other designated markings required by the ANSI specifications, the pipe manufactured shall have the letter "N.Y.C." and the date of manufacture distinctly stenciled at the foundry on all ductile iron pipe, fittings, and special castings. All markings shall be painted conspicuously in white on the outside of each pipe length, fitting, and special casting after the shop coat has hardened.
4. All pipes shall be cement lined in accordance with ANSI A21.4. However, thickness of lining shall be 1/8" minimum. A plus tolerance of 1/8" shall be permitted on all sizes of pipe.

C. Precast Reinforced Concrete Pipe (R.C.P.)

1. Precast reinforced concrete pipe shall conform to ASTM C76 and shall be Class III, Wall B of that Standard.
2. The pipe shall be made by a manufacturer who has had previous experience in the manufacture of precast reinforced concrete pipe. Inside surface of pipe shall be smooth.
3. Visual Inspection: Precast reinforced concrete pipe shall be subject to visual inspection at the site of the work. Individual imperfect pieces may be rejected on account of any of the following:
 - a. Fractures or Cracks: Fractures or cracks passing through the shell, except that a single end crack that does not exceed the depth of the joint shall not be cause of rejection. However, if such single end cracks exist in more than 10% of the pipe inspected, all defective pipe shall be rejected.
 - b. Mixing and Molding Imperfections: Defects that indicate imperfect mixing and molding.
 - c. Surface Defects: Surface defects indicating honeycombed or open texture.
 - d. Spalls: Spalls deeper than one-half the depth of the joint or extending more than 4" around the circumference. However, if spalls not deeper than one-half the depth of the joint or extending not more than 4" around the circumference exist in more than 10% of the pipe, all the defective pipe shall be rejected.
 - e. Misplaced Reinforcement: Exposure of the circumferential reinforcement when such exposure would indicate that the reinforcement is misplaced.
 - f. Water Deficiency: The complete absence of distinct web-like marking, which is indicative of a possible deficiency of water in the concrete mix, from the external surface of pipe made by any process in which the forms are removed immediately after the concrete has been placed.

4. Holes drilled or cast into pipe for lifting bolts shall be adequately plugged with a suitable precast concrete plug which shall be properly grouted and sealed before backfill is placed.
5. Pipe joints and gaskets that are rejected because of failure to conform to the requirements of ASTM C443 and pipe damaged from handling or any cause whatsoever, whether in or out of the trench, shall be removed from the site by the Contractor and replaced without additional cost to the Commissioner.

D. Backfill Material

Controlled fill as specified in Section 31 20 00.

E. Broken Stone Bedding

Broken stone shall be uniformly graded from 3/4" to 1/4" cubical in shape, unweathered stone complying with ASTM C33, size #67.

F. Grout

Grout shall be non-shrink conforming to CRD C-621 and show positive expansion when tested in conformance with ASTM C827.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Do not begin Work till existing subgrade has been properly compacted.

3.02 PREPARATION

- A. After delivery alongside the trench or pit, carefully examine each piece of reinforced concrete pipe for soundness and specification compliance. Acceptable pipe shall be marked with paint or other permanent marking material so that the marks are plainly visible after installation in the trench and before the pipe is covered.

3.03 INSTALLATION

- A. Layout piping in strict accordance with Drawings. Excavate trenches as described in Section 31 20 00 to lines and grades required for their proper installation. When applicable, provide enough depth to allow for concrete encasement or cradle.
- B. Unless otherwise required, lay all pipe straight between changes in alignment and at uniform grade between changes in grade. Provide full length support of pipe. Excavate bell holes for each pipe joint. When jointed in the trench, the pipe shall form a true and smooth line.
- C. Provide for and install all joints, couplings, fittings, rings and connections as per manufacturers' instructions and applicable ASTM and ANSI standards. Clean joint contact surfaces immediately

prior to jointing. Use lubricants, primers, or adhesives as recommended by the pipe or joint manufacturer.

- D. Keep trenches dry during pipe laying.
- E. Whenever practicable, start pipe laying at the lowest point and install the pipe so that the spigot ends point in the direction of flow.
- F. Ductile Iron Pipe

- 1. Cutting Pipe

- a. The Contractor's attention is directed to the fact that the cement linings used for ductile iron pipe and fittings are comparatively brittle. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe and linings, scratching or marring machined surfaces, and abrasion of the pipe coating or lining.
- b. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the Work.
- c. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is a laid so that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least 12" from the visible limits of the crack.
- d. Cut pipe only by means of abrasive saws, hack saws, wheel type cutters, or milling type cutters. The use of "squeeze" type pipe cutters and cutting torches will not be permitted. Examine all cut ends for possible cracks caused by cutting.

- 2. Installing Pipe and Fittings

- a. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.
- b. Clear each pipe and fitting of all debris, dirt, etc. before being laid and keep clean until accepted in the completed work.
- c. Lay pipe and fittings accurately to the lines and grades indicated on the Drawings or required. Care shall be taken to insure a good alignment both horizontally and vertically.
- d. Trenches for pipe shall be in accordance with Section 4.02 of the Standard Specifications, Department of Environmental Protection.
- e. Pipes and fittings shall be subjected to careful inspection and a hammer test just before being laid or installed.

G. Aggregate Bedding for Piping

1. Connections shall be laid on a 6" thick compacted layer of broken stone. The 6" thick layer of broken stone shall be placed on the subgrade of the trench for its full width. The subgrade must be prepared to the proper grade so that the ductile iron pipe may be placed on the broken stone base accurately to line and grade in agreement with the Drawings, Specifications, and as directed by the Commissioner.
2. Broken stone shall also be placed around the pipe to a depth of one-half (1/2) the outer diameter of the pipe and for the full width of the trench. The rest of the trench shall be backfilled and compacted as specified in Section 31 20 00.

H. Perform all work required to be done by a Licensed Master Plumber under his direct supervision.

I. Connect piping to other pipes and to manholes and catch basins. Provide proper support at connections to manholes and catch basins to prevent shear due to backfilling and loads. Grout joint with non-shrink grout.

J. Do not backfill until all lines are tested and approved. Backfill trenches as described in Section 31 20 00.

3.04 FIELD QUALITY CONTROL

A. Tests

1. All piping shall be field tested for leakage by the Contractor at own expense. When the pipe lines are laid in excavation or bedded in concrete, the testing shall be done prior to refilling or placing the concrete covering. All joints shall be examined during the test and all leaks shall be repaired to the satisfaction of the Commissioner. The Contractor shall thoroughly clean all piping before placement and keep all lines free from every kind of foreign matter of whatever origin.
2. Perform tests required by the Building Department and Sewer Department in the presence of their representative and the Commissioner.
 - a. Test piping by applying 10' of head pressure for one hour.
 - b. Testing shall be in accordance with the requirements of the Bureau of Sewers Standard.

B. Inspection

1. The Commissioner reserves the right to order the Contractor to disassemble or take apart any or all material and equipment called for in order that it may be inspected to see that it has been constructed in strict accordance with the Drawings, Specifications, and details. If, after inspection, it is found to fully comply, the Contractor shall properly reassemble all such material and equipment at the Commissioner's expense.
2. Any material or equipment that does not fully comply with the requirements of the Drawings and Specifications shall be rejected and shall be at once removed from the

premises and shall be replaced with new material and equipment that complies fully with the requirements of the Drawings and Specifications at the Contractor's expense.

3.05 ADJUSTMENTS

- A. Thoroughly clean and adjust any irregularities to the satisfaction of the Commissioner.

END OF SECTION

Section 334913
Precast Concrete Drainage Structures

PART 1 - GENERAL**1.01 DESCRIPTION OF WORK**

- A. Provide precast concrete catch basins, manholes, drywells and detention tanks as indicated on the Drawings and as specified herein. Subsequently, in this Section, precast catch basins, manholes, drywells and detention tanks will be referred to as "precast units".
- B. Provide cast iron:

Manhole frames and covers; catch basin frames and covers; traps.

1.02 RELATED SECTIONS

- A. Site EarthworkSection 310000
- B. Site Drainage Piping SystemSection 334113.01

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. Federal Specifications (FS).

1.04 SUBMITTALS

- A. Shop Drawings
 - 1. Submit for approval before casting precast units, three sets of Shop Drawings for each item to be cast, showing details of all pipe entries, finish grades and other pertinent information.
 - 2. Submit Shop Drawings for manhole and catch basin frames and covers; traps.
- B. Submit testing laboratory daily logs and certifications as specified in Art. 2.03.

1.05 QUALITY ASSURANCE

- A. Provide controlled inspection and testing at manufacturer's plant as indicated in Art. 2.03.
- B. Manufacturer's qualifications

At least 2 years of successful experience in precasting units of type specified herein.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle precast units in such manner so not to damage the units.

NOTE: Patching of units will not be acceptable.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers of Precast Units

1. AFCO Precast Corp., East Patchogue, NY 11772
2. Coastal Pipeline Products Corp., Calverton, NY 11933
3. LHV Precast, Inc. Kingston, NY 12401

B. Manufacturers of Exterior and Interior Coatings for Precast Units

1. M. A. B. Paint Broomall, PA 19008.
2. Mercury Paint Corp. Brooklyn, NY 11203
3. Sherwin Williams Corp. Cleveland, OH 44101

2.02 MATERIALS

- A. Concrete Mix Design: 5,000 p.s.i.
Cement: 752 #/CY
Sand: 1130 #/CY
3/4" Agg. 1700 #/CY
Water 354 #/CY

- B. Min. acceptable 28-day compressive strength: 4,000 p.s.i.

- C. Precast unit reinforcing

Area requirements shall comply with ASTM C-478, except that all wall sections shall be reinforced with W.W.M. as indicated on the Drawings.

- D. Reinforcing Bars

fs = 60,000 p.s.i. yield ASTM A-615. W.W.M.: fs = 65,000 p.s.i. yield ASTM-A185.

- E. Refer to the Drawings for other requirements.

- F. Precast Unit Steps, Manufacturers:

1. Campbell Foundry Co. Pattern #2592 (cast iron, diamond non-skid design) with stainless bolts and washers with Ackerman-Johnson Expansive Screw Anchors (Cat. No. 762-62, with non-corrosive brass cones) and 1/4-inch thick neoprene gaskets, or approved equal product manufactured by Neenah Foundry Co., Neenah, WI 54946, or McKinley Iron Works, Inc., Ft. Worth, TX 76101.

2. M.A. Industries, Inc. Model PS-4-B copolymer polypropylene plastic, with 1/2-inch diameter grade 60 reinforcement, or approved equal product manufactured by Neenah Foundry Co., Neenah, WI 54946, or McKinley Iron Works, Inc., Ft. Worth, TX 76101..
- G. Epoxy Bond Agent Manufacturers:
- | | |
|-------------------------|----------------------|
| Fosroc, Inc. | Plainview, NY 11803 |
| E-Poxy Industries, Inc. | Ravena, NY 12143 |
| Dayton Superior Corp.. | Miamisburg, OH 45342 |
- H. Self-sealing Butyl Gasket, 7/8" x 7/8" or 1" diameter, Fed. Spec. SS-S-00210. Manufacturers:
- | | |
|---------------------------------|----------------------|
| Hamilton Kent | Kent, OH 44240 |
| Allstate Gasket & Packing, Inc. | Hicksville, NY 11801 |
| Darcoid Co., Inc. | Hicksville, NY 11801 |
- I. "O"-Ring Joint, Neoprene (See Drawings for size). Manufacturers:
- | | |
|---------------------------------|----------------------|
| Hamilton Kent | Kent, OH 44240 |
| Allstate Gasket & Packing, Inc. | Hicksville, NY 11801 |
| Darcoid Co., Inc. | Hicksville, NY 11801 |
- J. Exterior Coating
- Polyamide epoxy coal tar.
- K. Interior Coating
- Two component high solids polyamide epoxy resin coating in accordance with ANSI/NSF Standard 61.
- L. Non-Shrink Grout
1. Sika Company Bayshore, NY 11706
 2. Quikrete Company Atlanta, GA 30305
 3. Unisorb Installation Technologies Jackson, MI 49204
- M. Expansion Screw Anchors with malleable lead shields in accordance with Federal Specifications FF-S-325C, Group 1, Type 1, Class 1.
- Manufacturers:
- | | |
|------------------------------|-------------------|
| Simpson Strong-Tie Co., Inc. | Addison, IL 60101 |
|------------------------------|-------------------|

Powers Fastening, Inc.

New Rochelle, NY 10802

Hilti Corp.

Tulsa, OK 74114

2.03 CONTROLLED INSPECTION AND TESTING

- A. Controlled inspection and testing shall be conducted at the manufacturer's plant by a Testing Laboratory approved by the Commissioner.
- B. Controlled inspection and testing shall comply with the New York City Building Code and shall comply with the standards of construction established by the Bureau of Sewers for manhole construction, and shall include, but not be limited to the following procedures:
 - 1. All testing shall comply with New York City requirements and the A.S.T.M.
 - 2. Perform daily batch plant inspection to ascertain that proper concrete material gradations are performed. Sieve both fine and coarse aggregates to check gradations.
 - 3. Calculate finis modulus and percent moisture on a daily basis.
 - 4. Verify mill certificates for concrete.
 - 5. Verify mix designs by checking computer printout tapes or scale measurement proportioning of materials.
 - 6. Inspect formwork and reinforcement for manhole, risers, bases, collars and covers.
 - 7. Inspect methods and concrete placement.
 - 8. Prepare a minimum of four concrete cylinders for each 50 yards batched.
 - 9. Tag and verify, independently, manholes and catch basins and ancillary parts with each group of cylinders.
 - 10. Tag and report cylinders with corresponding manhole castings on a daily basis.
 - 11. Check slump, air content, weight per cubic foot and temperature for each batch prepared.
 - 12. Store cylinders in a proper humidified room under Laboratory's directions.
 - 13. Inspect and verify that formwork remains intact in a properly controlled area for 24 hours minimum.
 - 14. Cap and break cylinders at 7 and 28 days or until full design strength is achieved. At that time break a minimum of two cylinders. Store the remaining cylinders prepared in a batch for 28 days before discarding.
 - 15. Inspect completed precast unit components for defects and voids prior to shipment to the job-site.
 - 16. Monitor material and finish product handling to assure that unnecessary vibrations are not imparted to the cast concrete.

- C. The Contractor shall submit to the Commissioner before delivering the precast units to the jobsite, the following:
 - 1. Copies of daily logs of the testing laboratory, indicating pertinent information.
 - 2. Certification from the testing laboratory that construction of the precast units is in compliance with the requirements of the Bureau of Sewers of the City of New York.

2.04 FABRICATION

- A. Fabricate the precast units to the sizes and shapes shown on the Drawings, with pipe openings, precast collars, manhole steps, lift inserts and other items as indicated.
- B. Cast units in tight, well-built forms; vibrate concrete to ensure smooth, laitance-free surfaces.
- C. Finished units shall be warp-free, of uniform thicknesses with shapes, sizes, pipe openings, inserts and all other details as shown on the Drawings and as specified herein.
- D. Provide 5/8" threaded dowels at pipe opening locations as detailed on the Drawings.
- E. See Art. 2.03 - CONTROLLED INSPECTION AND TESTING.
- F. Provide scoring for bond on bottom slab of the precast units as detailed on the Drawings.

2.05 PROTECTIVE COATINGS

- A. Interior coating for precast units

Fabricator shall apply coating as follows:

- 1. Surface Preparation: Surfaces shall be free of dust, oil, grease, laitance, or any other foreign matter.
- 2. After etching with muriatic acid, or whip blasting, apply two finish coats of the two component high solids polyamide epoxy resin coating. If sprayed; 4.0 mils dry per coat; if rolled, 2.0 mils dry per coat. Apply in strict accordance with the manufacturer's recommendations.

- B. Exterior coating for precast units

Fabricator shall apply coating as follows:

- 1. Surface Preparation: Surfaces shall be free of any foreign matter.
- 2. Apply polyamide epoxy coal tar coating by brush, roller or spray in strict accordance with the manufacturer's recommendations.
- 3. Provide two coats; each coat, 6.0 mils dry film thickness.

2.06 MANHOLE FRAMES AND COVERS

- A. Manhole frames and covers shall be heavy duty cast iron, as manufactured by Campbell Foundry, Harrison, NJ 07029, pattern #1453, with 4 equally spaced pentagonal head locking bolts countersunk

into the cover and threaded into the frame, or approved equal product manufactured by Neenah Foundry Co., Neenah, WI 54946, or McKinley Iron Works, Inc., Ft. Worth, TX 76101.

2.07 CATCH BASIN FRAMES AND GRATES

- A. Catch basin frames and grates shall be 24" square heavy duty cast iron with ADA compliant slotted openings with 4 equally spaced pentagonal head locking bolts countersunk into the grate and threaded into the frame, as manufactured by Campbell Foundry, Harrison, NJ 07029, pattern 2815, or approved equal product manufactured by Neenah Foundry Co., Neenah, WI 54946, or McKinley Iron Works, Inc., Ft. Worth, TX 76101.

2.08 TRAPS

- A. Traps shown in catch basins or manholes shall be cast iron standard "hooded" design pattern 2560 series as manufactured by Campbell Foundry, Harrison, NJ 07029, or approved equal product manufactured by Neenah Foundry Co., Neenah, WI 54946, or McKinley Iron Works, Inc., Ft. Worth, TX 76101.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install or place precast units as specified in ASTM C 891 and as shown on the Drawings. Place level and plumb, and to proper depths. Coordinate with pipe connection locations. Install butyl gaskets (or "O" rings as detailed) at joints, in such manner to seal completely.
- B. Install cast iron manhole and catch basin frames and covers, and traps, as detailed on the Drawings and as recommended by the manufacturer.

3.02 ADDITIONAL FIELD PROTECTION

- A. After installation of Precast units and before backfilling, provide additional protective coatings as follows:
 - 1. Interior: Where damage has occurred to the shop applied coating, provide an additional touch up coating of the two component high solids polyamide epoxy resin. (2.0 mil dry film thickness). Apply as described in Art. 2.05.A.
 - 2. Exterior: Where damage has occurred to the shop applied coating, provide an additional touch up coating of the polyamide epoxy coal tar. (2.0 dry film thickness). Apply as described in Art. 2.05-B.
- B. Make pipe-to-precast unit connections as shown on the Drawings, using non-shrink grout and epoxy bonding agent as detailed.
- C. Paint cast iron frames and covers with one coat of black asphaltum paint.

END OF SECTION

SECTION 430000

COMBINED UNDERGROUND DIESEL FUEL AND EMERGENCY GENERATOR SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, material, tools, and equipment and install the combined underground fuel systems, as required by the Contract Documents.

1.02 SUBMITTALS

The following items shall be submitted to the Owner's Representative for review and approval in accordance with SECTION: SUBMITTALS.

- A. Shop drawings, showing proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of work including clearances for maintenance and operation.
- B. Manufacturer's descriptive, technical literature, and catalog cuts, including installation instructions.
- C. Any certifications and the results of any testing performed to demonstrate that the work and equipment complies with the Contract Specifications.
- D. Contractor shall provide three (3) O&M manuals in 3-ring vinyl binders incorporating all manufacturers' information describing operations and maintenance schedules for the system installed. O&M manuals shall include wiring diagrams, detailed equipment list and spare parts required at standard intervals.

1.03 QUALITY ASSURANCE

- A. Installation of all diesel fuel systems shall be performed by a Contractor who is a New York City-licensed installer for underground tank systems. The Contractor shall obtain a class "A" or "B" oil burner equipment installer license from the New York City Department of Buildings. The Contractor shall be certified by the tank manufacturer as a trained fiberglass tank installer. The Contractor shall have a minimum of 5 years of experience in installing fiberglass tanks.
- B. The Contractor shall purchase the diesel fuel systems from a manufacturer approved by the Owner's Representative, the New York City Fire Department, and the New York City Department of Buildings. The manufacturer shall maintain a service depot within the City with parts and service personnel available for servicing of parts at any time. The manufacturer shall furnish required supervision

for the installation of the systems, and shall furnish an experienced installation and maintenance worker for the supervision of personnel in the initial operation and maintenance of the systems.

- C. The Contractor shall install compatible components and shall perform all modifications necessary for the proper operation and guarantee of the equipment. The Owner's Representative reserves the right to require the Contractor to make such tests, during the installation and upon the completion thereof, as may be necessary to demonstrate that the work and equipment, as installed, complies with the Contract Specifications and requirements provided herein. The Contractor shall provide all labor, instruments, and apparatus required for such tests. If any of the work or equipment fails to meet the Contract Requirements or to function properly, the defects shall be rectified at the Contractor's own expense by readjusting, or by removing and replacing the faulty work or equipment until, under test, the requirements are met. The Owner's Representative reserves the right to check the Contractor's instruments or to furnish his own instruments.

1.04 ALTERATIONS TO ACCOMMODATE EQUIPMENT

The Contract Drawings indicate a typical installation based on a certain make or brand of equipment, and are not to be construed as representing the layout for any other make or brand. Any alterations that are necessary to adequately and satisfactorily accommodate the equipment to be installed under this Contract shall be made by the Contractor at his own expense, in accordance with the Contract Documents and subject to approval by the Owner's Representative.

1.05 APPLICABLE STANDARDS

All work performed under this Section shall comply with the following standards and all other applicable federal, state, and local standards including revisions to the date of Contract.

ASME	American Society of Mechanical Engineers
NFPA	National Fire Protection Association
UL	Underwriters' Laboratories
NEC	National Electrical Code
NYCEC	The New York City Electrical Code
ANSI	American National Standards Institute
IEEE	Institute of Electrical and Electronic Engineers
	The Board of Standards and Appeals of the City of New York
	The Building Code of the City of New York
	New York City Fire Law Handbook
API	American Petroleum Institute

PART 2 - PRODUCTS

2.01 COMBINED UNDERGROUND DIESEL FUEL STORAGE TANK

- A. Underground diesel fuel storage tanks shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size, and location of underground diesel fuel storage tanks for each site. Each underground storage tank shall be Xerxes DWT type with dry interstitial space, as manufactured by Xerxes Corporation, Minneapolis, Minnesota, or approved equal.
- B. Each underground storage tank shall be constructed of double-walled, fiberglass reinforced plastic (FRP) with a space between the primary and secondary shell walls to allow for the free flow and containment of all leaked products from the primary tank. This space shall also allow for the insertion of an interstitial monitoring device as specified in SECTION: INSTRUMENTATION AND CONTROL. The tank and the tank manufacturer shall be approved by the New York City Fire Department for underground installation in New York City.
- C. Hydraulic Pressure: Each tank shall have a primary shell suitable for use under a 30 psi hydraulic pressure, and a secondary shell suitable for use under a 10 psi hydraulic pressure. The pressure test shall be performed in accordance with the manufacturer's recommendations.
- D. Each tank shall include, but not be limited to, the following appurtenances, as shown on Contract Drawings:
1. Manways

Fiberglass manway with a manway cover, as manufactured by Xerxes Corporation, or approved equal. The Contract Drawings show the size, number, and location of manways required for each tank.
 2. Sump Collars

Fiberglass sump collar around tank manway for installation of containment sump. The sump collar shall be as manufactured by Xerxes Corporation, or approved equal. The fiberglass sump collar shall be compatible with the tank containment sump type shown in the Contract Drawings. The Contract Drawings show the type, number, size, and location of sump collars required for each tank.
 3. Fittings

A sufficient number of National Pipe Thread (NPT) fittings shall be supplied in the tank and the manway covers to accommodate all piping and monitoring devices. The Contract Drawings show the size, number, and location of fittings required for each tank and manway cover.

4. Strike Plates

A steel strike plate shall be located in the primary tank beneath each tank opening and shall be a minimum of 12 inches by 12 inches. The strike plates shall be installed by the tank manufacturer and shall be included in the manufacturer's warranty.

5. Anchoring Straps

Tank anchoring straps are required for each installed tank. Straps shall be constructed of FRP, and shall be as manufactured by Xerxes Corporation, or approved equal. The size, number, and location of straps shall be as required by the tank manufacturer. Straps will be used for anchoring tanks to the concrete bottom slab as shown on the Contract Drawings.

E. Surface Loads: Each tank's primary and secondary shell shall be suitable for use under NYSDOT H-20 live loads.

F. Compressive load bearing strength: Each tank's primary and secondary shell shall be suitable for use under a minimum of 7 feet of backfill pressure. The safety factor against buckling shall be 3 or greater.

2.02 CONTAINMENT SUMPS

A. Tank Containment Sump:

1. The containment sump assembly shall be provided over tank manways where required by the Contract Drawings. The Contract Drawings show the type, number, size, and location of sump assemblies required for each tank. Each containment sump assembly shall be Fibrelite Model SR15, as manufactured by Fibrelite Corporation of Pawcatuck CT, or approved equal.
2. Each containment sump assembly shall be constructed of resin transfer molded composite FRP. Each containment sump assembly shall consist of a composite sump, a composite internal water tight sump lid, and an integrated composite manhole cover, frame and skirt over the sump. Each manhole cover, frame, and skirt, shall be sealed to the sump but shall not transfer surface loads from the manhole cover and frame to the sump. Each sump base shall be constructed with 16 sides to facilitate entry of piping and conduit.
3. Each containment sump assembly shall be watertight, with a watertight sump and an integrated watertight manhole cover and frame. Each manhole shall be watertight with an integral seal in the manhole cover to prevent the entry of water when the manhole cover is in the frame. Each

sump shall include a removable reservoir for collecting water entering when manhole cover is removed in wet conditions.

4. Each opening in the sump base, including openings for piping and electrical conduits, shall be provided with Icon new construction petro seal filled entry boots that secure the piping or conduit to the sump. Each entry boot shall fasten entirely from the inside of the sump, and shall be replaceable entirely from the inside of the sump after the sump is installed in the ground. All entry boot kits shall be third party tested for prolonged exposure to petroleum products. All entry boot kits shall be provided by the sump manufacturer.
5. Each containment sump assembly shall include appropriate fittings, adapters, and bonding agents for watertight installation on the sump collar of the fiberglass tank as shown on the Contract Drawings. The containment sump shall be designed for installation on the fiberglass tank in such a way that allows the removal of the tank manway cover without compromising the integrity of the sump assembly. Each sump will be furnished with interior and exterior heavy duty bonding kit as provided by the manufacturer
6. Each manhole frame shall be designed so that the manhole cover will fit securely and not spin in the frame. Each frame shall prevent the entry of surface water into the sump. This system shall include a single vertical gasket and shall incorporate no penetrations. Each cover will be self-locking.
7. Each manhole cover and frame shall be suitable for use under NYSDOT H-20 live loads. The surface resistivity of each cover shall be less than 1×10^{-8} Ohms to prevent the buildup of static charge.
8. Each manhole cover shall include a fulcrum style lifting handle provided by the sump manufacturer. Each handle shall be formed with 1/8-inch stainless steel tubing with alloy casting for the key and a plastic grip. Each handle shall include a foot lever tool and a locking tool.
9. Each containment sump assembly shall be capable of being tested at different stages of installation to verify the integrity of the sump assembly, including all piping and conduit entry boots, the tank manway, and the manhole cover and frame assembly. This testing method shall be designed for verifying sump integrity after sealing to the sump collar and installation of piping and conduit, after placement of backfill, and when tank top slab is installed and installation is complete. The sump manufacturer shall provide a testing method that employs instruments and procedures that yield reproducible results that will ensure that sump assembly installation is watertight. The sump manufacturer shall provide a factory-trained technician to test the sump.

B. Dispenser Pan

1. Dispenser pan shall be provided in the fuel dispensing island beneath each dispenser where required by the Contract Drawings. The Contract Drawings show the type, number, size, and location of manhole assemblies required for each dispenser. Each dispenser pan shall be an EPP Dispenser Containment Pan, as manufactured by Environmental Protection Products, Incorporated, East Farmingdale, New York, or approved equal.
2. Dispenser Pan: Each dispenser pan shall be constructed of fiberglass and shall have a built in waterstop at least one inch above the finished surface of the island. Each dispenser pan shall be a minimum of 30 inches deep and shall be sized to be compatible with the dispenser. A steel, adjustable shear valve mounting assembly shall be included in the dispenser pan for each shear valve, and shall be capable of supporting the shear valve so that it functions properly during an impact. Each dispenser pan shall have openings in the side for piping and electrical conduit. Each opening in the dispenser pan shall be provided with watertight entry boots. Each entry boot kit shall be provided by the sump manufacturer.

2.03 MANHOLE ASSEMBLY**A. Manhole Assembly**

1. Type I manhole cover, frame, and skirt assemblies shall be provided in the tank top slab over tank openings where required by the Contract Drawings. The Contract Drawings show the type, number, size, and location of manhole assemblies required for each tank top slab. Each Type I manhole assembly shall be a Fibrelite Composite Manhole, as manufactured by Fibrelite Corporation, of Pawcatuck CT, or approved equal.
2. The top of all manhole assemblies shall be raised .5 inch higher than the finished concrete slab. The concrete shall taper to 1 foot away in all directions from the manhole cover.
3. Cover: Each manhole cover and frame shall be suitable for use under NYSDOT H-20 live loads, and carry the Fibrelite HD D400 capacity. The surface resistivity of each cover shall be less than 1×10^{-8} Ohms to prevent the buildup of static charge. Each manhole frame shall be designed so that the manhole cover will fit securely and not spin in the frame.
4. Frame: Each frame shall prevent the entry of surface water into the sump. This system shall include a single vertical gasket and shall incorporate no penetrations. Each cover will be self-locking.

5. Skirt: Each manhole skirt shall be constructed of fiberglass and colored to match the cover with which it will be used. The skirt shall extend to within two inches of the manhole cover. Each skirt will be supplied with a stabilizer rod kit for concrete installation. The rod kit shall be made of stainless steel.
6. Each manhole cover shall include a fulcrum style lifting handle provided by the sump manufacturer. Each handle shall be formed with 1/8-inch stainless steel tubing with alloy casting for the key and a plastic grip.
7. Id tag: Each Cover will be furnished with Fibrelite Custom ID tag with API Markings and Tank Specific Language.
8. 40 inch diameter manholes shall be Fibrelite Model FL100HD, or approved equal
9. 12 inch diameter manholes shall be Fibrelite Model FL120HD, or approved equal
10. 18 inch diameter manholes shall be Fibrelite Model FL180HD, or approved equal.

2.04 SPILL CONTAINMENT FILL BOX ASSEMBLY

A. Below Grade Spill Containment Fill Box Assembly

1. Below grade spill containment fill box assemblies shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size, and location of spill containment fill box assemblies required for each tank. Each spill containment fill box, manhole cover, frame, and skirt assembly shall be Fibrelite Spill Containment Fill Box Model 1228 - shallow burial, as manufactured by Fibrelite Corporation, Pawcatuck, CT, or approved equal.
2. Spill Containment Fill Boxes:
 - a. Each below grade spill containment fill box shall be constructed of 304 stainless steel, capable of withstanding a 150-psi line test.
 - b. Each spill containment fill box shall have a capacity of no less than fifteen (15) gallons for containment of product spilled during the coupling and uncoupling of the fill hose and all related tank-filling operations. Each spill containment fill box shall be provided with an automatic drain, test plug assembly, lockable fill cap, bronze fill adapter, and a No. 20-mesh brass screen.

- c. An FRP product ID tag shall be provided with each spill containment fill box and inscribed as follows:

Diesel
(Actual Capacity of Tank) Gallons
Tank No. 1, No. 2, etc.

The ID tag/sign shall be API Color Coded, Model FRP-ID-C, as manufactured by United Signs or approved equal.

3. Spill Containment Fill Box Manhole Covers and Frames:

- a. Cover: Each manhole cover and frame shall be suitable for use under NYSDOT H-20 live loads, and carry the Fibrelite HD D400 capacity. The surface resistivity of each cover shall be less than 1×10^{-8} Ohms to prevent the buildup of static charge. Each manhole frame shall be designed so that the manhole cover will fit securely and not spin in the frame.
- b. Frame: Each frame shall prevent the entry of surface water into the sump. This system shall include a single vertical gasket and shall incorporate no penetrations. Each cover will be self-locking.
- c. Skirt: Each manhole skirt shall be constructed of fiberglass and colored to match the cover with which it will be used. The skirt shall extend to within two inches of the manhole cover. Each skirt will be supplied with a stabilizer rod kit for concrete installation. The rod kit shall be made of stainless steel.
- d. Each manhole cover shall include a fulcrum style lifting handle provided by the sump manufacturer. Each handle shall be formed with 1/8-inch stainless steel tubing with alloy casting for the key and a plastic grip. Cover: Each manhole cover and frame shall be suitable for use under NYSDOT H-20 live loads. The surface resistivity of each cover shall be less than 1×10^{-8} Ohms to prevent the buildup of static charge.
- e. Each unit will be furnished with Veeder-Root magnetostrictive sensor, capable of detecting water or product, and capable of conducting a sump tightness test.
- f. All entry fittings will be Icon new contraction fittings, filled with petro seal paste to provide the maximum life of the units and all entry fittings will be factory installed.

2.05 FUEL DISPENSER

FEBRUARY 8, 2013

430000-8

COMBINED UNDERGROUND
DIESEL FUEL AND EMERGENCY
GENERATOR SYSTEM

- A. Fuel dispenser shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of fuel dispensers for each site. Each fuel dispenser shall be an Atlas 9152K Series Fuel Dispenser, as manufactured by Gasboy International, Inc., of Greensboro, North Carolina, or approved equal.
- B. The fuel dispenser system shall be constructed of a heavy-duty meter cabinet with product hose assemblies and nozzle hooks. Each fuel dispenser system shall have a minimum pressure rating of 50 psig and shall be suitable for use with the products to be stored in the tank system. Each fuel dispenser shall be UL-listed and approved for use in New York City by the New York City Fire Department.
- C. The fuel dispenser shall have, at a minimum, the following features:
 - 1. Meter

Four-piston, positive displacement type meter that is factory tested and calibrated for accuracy at any operating speed or pressure.
 - 2. Solenoid

Normally closed solenoid that opens flow in product lines when pump activates.
 - 3. Register

Mechanical type register with power reset interlock that is displayed on both front and back of cabinet. Register shall read in gallons and tenths of gallons, up to 999.9 gallons.
 - 4. Totalizer

Non-resetable totalizer that is displayed on the front of the cabinet. Totalizer shall read in gallons and tenths of gallons, up to 999,999.9 gallons, and then roll over.
 - 5. Pulser

Wheel pulser with 100:1 output ratio for dedicated use of a card reader fuel management system.
 - 6. Dispenser Cabinet
 - a. Each dispenser cabinet shall be constructed of stainless steel.
 - b. Each dispenser brand panel shall read "DIESEL".

- c. Each dispenser shall include fluorescent panel lighting that illuminates the product panel and register area of the dispenser when the pump is activated.

7. Hose Retractor

High hose retractor shall be included with dispenser. The retractor shall be Gasboy Model 90-750-2 or approved equal.

8. Manual Hand Crank

The manual hand crank shall be Gasboy Kit No. 032048 ("K option") or be compatible with the supplied dispenser.

- D. Each fuel dispenser shall include the following appurtenances where required by Contract Drawings:

1. Product Hose Assembly

Product hose assemblies shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of product hose assemblies for each dispenser. Each product hose assembly shall be suitable for use with the products to be stored in the tank system. Each product hose assembly shall have, at a minimum, the following features:

a. Product Hose

Each product hose shall be constructed of synthetic rubber tubing, with wire braid reinforcement, and a synthetic rubber cover. Each product hose shall be colored in accordance with the American Petroleum Institute Color and Symbol Code. Each product hose shall have the proper fittings installed on each end of the hose. Each product hose shall be Goodyear Flexsteel Hardwall 532 Series Petroleum Dispensing Hose, as manufactured by Goodyear Tire and Rubber Company, Hose Division, Norfolk, Nebraska, or approved equal. The product hose shall be ¾-inch by 15 feet long.

b. Nozzle

Each nozzle shall be constructed of an aluminum body and steel lever with an automatic shut-off device that shuts off flow through nozzle if it falls from the tank or raises above horizontal. Each nozzle shall be equipped with a full grip guard and splashguard

colored in accordance with the American Petroleum Institute Color and Symbol Code. Each nozzle shall be OPW Model 11AK-0400, as manufactured OPW Fueling Components, Cincinnati, OH, or approved equal.

c. Breakaway

Each breakaway shall be constructed of an aluminum body, die-cast zinc coupling, and zinc plated steel springs. Each breakaway shall be designed to separate when subject to a pull force of 250 pounds. Each breakaway shall be constructed of double poppet and shall be designed to minimize fuel spillage after breakaway. Each breakaway shall be OPW 66 Series Breakaway Connector, as manufactured by OPW Fueling Components, Cincinnati, Ohio, or approved equal.

d. Swivel

Each swivel shall be constructed of a high aluminum zinc body with double O-ring seals at each swivel joint. Each swivel shall be designed to provide a full 360-degree spherical rotation with multiple planes of rotation. Each swivel shall be Husky Model 0087 or 0350, as manufactured by Husky Corporation, Pacific, Missouri, or approved equal.

2. Fuel Filter Assembly

Fuel filter assemblies shall be provided for each dispenser hose assembly. Each fuel filter assembly shall include an external filter housing, with a filter cartridge installed and a spare filter cartridge. Each fuel filter housing shall be Centurion Model 1000 External Fuel Filter, and each filter shall be Standard Flow, 400-HS10 Hydro-sorb Filter, or approved equal.

2.06 TANK IDENTIFICATION AND SIGNAGE

A. Permanent stencils, labels, or plates shall be mounted on tanks and fill ports; and shall include the following information:

1. Manufacturer's statement that tank conforms with Bulk Storage Regulation 6 NYCRR Part 614
2. Standard of design by which tank was manufactured
3. List of products and additives that may be permanently stored in tank
4. Year in which tank was manufactured

5. Unique identification number
6. Dimensions, design, working capacity, and tank model number
7. Name of tank manufacturer
8. Date of tank installation (fill port only)
9. Statement indicating "Approved by the New York City Fire Department"

B. The following signs shall be installed at all active diesel fuel sites:

1. Fill box Manhole Cover:

A 6-inch by 6-inch sign indicating the product type and tank capacity. Fasten with six (6) #6 self tapping stainless steel screws.

2. Overfill Alarm:

A 20-inch by 16-inch black and yellow sign stating: "CAUTION: When Alarm Sounds, Tank Filled to Capacity, DO NOT OVERFILL", shall be placed in the immediate vicinity of the flashing red alarm light.

3. Dispenser

- a. A 10-inch high by 14-inch wide sign shall be placed on or near the dispenser island stating the following: "NO SMOKING WHILE REFUELING". The sign shall be black and red in color, with a white background.
- b. A 10-inch high by 14-inch wide sign shall be placed on or near the dispenser island stating the following: "SHUT OFF ENGINE WHILE REFUELING". The sign shall be black and red in color with a white background.

4. Emergency Shut-off Sign

Two 12-inch by 18-inch signs stating "EMERGENCY SHUT-OFF SWITCH" shall be placed as shown on the Contract Drawings.

2.07 EMERGENCY SHUT-OFF SWITCH

Two emergency pump shutoff switches shall be installed and located for each pump as shown on the Contract Drawings. Emergency switch shall be in sight of dispenser but at least ten feet (10') from all dispenser units.

2.08 PETROLEUM PRODUCT PIPING

All petroleum product piping including fill lines, product supply and return lines, and vent lines, shall be in accordance with SECTION: PETROLEUM PRODUCT PIPING.

2.09 INSTRUMENTATION AND CONTROL

All instrumentation and control, including leak detection, inventory monitoring, and alarms, shall be in accordance with SECTION: INSTRUMENTATION AND CONTROL.

PART 3 - EXECUTION

3.01 GENERAL

- A. Maintain site in a neat and workmanlike manner. Remove debris, dirt, rubbish, etc., from site at end of each day.
- B. Contractor is responsible for verifying all dimensions in field and for ensuring that interferences do not exist between Contractor's work and that of surrounding work.
- C. Initiate a safety program to prevent injury to residents, employees and visitors. Do not block streets or exits.
- D. Provide and maintain any structures or lighting and take all measures required by law for protection of public.
- E. Perform contract work so that no injury or damage will occur to public, structures and property including streets, paving, monitoring wells, recovery wells, sewers, water, electric or any other pipes, mains and conduits. Should any damage or injury be caused by Contractor or anyone in his employ, or by improper or defective workmanship under this contract, Contractor shall repair such damage and assume all responsibility for such injury without cost to Owner.
- F. At excavations, provide barriers on same day that excavation is made and check barrier integrity daily so that protection is provided at all times.

3.02 PRODUCT DELIVERY AND STORAGE

The Contractor shall coordinate delivery and storage of all material, tools, and equipment with site personnel and the Owner's Representative.

3.03 INSTALLATION

- A. All equipment installed by the Contractor shall be installed in accordance with the manufacturer's instructions.
- B. Each spill containment fill box assembly shall be located at least 10-feet from any building entrance as required by the New York City Fire Prevention Code.
- C. Provide and install a properly colored wall sign as per Fire Prevention Rule 6.4.4 at location of fill terminal, designating the type of fuel to be delivered. The sign shall be screwed to the wall and in plain view.
- D. All painting work shall be performed in accordance with SECTION: PAINTING

3.04 TESTING

- A. Shop Tests: Shop testing of the tanks shall conform to the testing methods and procedures established in the above Subpart: Applicable Standards. Where leaks are detected, the tanks must be repaired as recommended by standards.
- B. Field Test: Field testing shall conform to requirements of the manufacturer, FDNY Bureau of Fire Prevention and Contract Drawings.
- C. Each tank containment sump assembly shall be tested in accordance with the manufacturer's testing equipment and methods to verify the integrity of the sump assembly. This test shall demonstrate that the sump assembly, including all piping and conduit entry boots, the tank manway, and the manhole cover and frame assembly, is watertight. Each containment sump assembly shall be tested in the presence of the Owner's Representative at different stages of installation to verify the integrity of the sump assembly. This test shall be performed on each sump assembly after installation of piping and conduit, after placement of backfill, and when tank top slab is installed and installation is complete. If a sump assembly fails this test, the Contractor shall take appropriate steps, at his own expense, to correct the installation until he can demonstrate that the sump is watertight.

END OF SECTION

SECTION 435000

PETROLEUM PRODUCT PIPING

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, material, tools, and equipment and install all petroleum product piping, valves, and related appurtenances where required by the Contract Documents.

1.02 SUBMITTALS

The Contractor shall submit all manufacturer's specifications, installation instructions, relief valve calculations, pipe test results, and emergency vent sizing to the Owner's Representative for approval in accordance with SECTION: SUBMITTALS.

1.03 APPLICABLE STANDARDS

The publications are referred to in the text by basic designation and shall be the latest published version.

- American Society for Testing and Materials (ASTM)

ASTM A 53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

ASTM D 2996 Specification for Filament-Wound Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe

Piping and accessories shall comply with ANSI, ASTM, ASME, AWWA, ISA, and all other applicable federal, state, and municipal codes including revisions to date of the Contract.

PART 2 - MATERIALS

2.01 FIBERGLASS PRODUCT PIPING AND FITTINGS

- A. Fiberglass product piping and fitting systems shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of fiberglass product piping systems for each site. Each fiberglass product piping system shall be Dualoy 3000/L Fiberglass Pipe and Fittings, as manufactured by Ameron Fiberglass Pipe Division, of Houston, Texas, or approved equal.

- B. Each piping system shall be constructed of fiberglass-reinforced epoxy and shall be suitable for use with the products to be stored in the tank system. The piping system shall be UL-listed and approved for use in New York City by the New York City Fire Department. In addition, diesel and gasoline piping systems shall be suitable for use with 100% methanol.
- C. Each fiberglass piping and fitting joint shall be adhesive-bonded. The pipe shall have a minimum pressure rating of 175 psig and fittings shall have a minimum pressure rating of 100 psig.

2.02 FIBERGLASS SECONDARY CONTAINMENT PIPING AND FITTINGS

- A. Fiberglass secondary containment piping and fitting systems shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of fiberglass secondary containment piping systems for each site. Each fiberglass secondary containment piping system shall be Dualoy 3000/L Fiberglass Secondary Containment Pipe and Fittings, as manufactured by Ameron Fiberglass Pipe Division, of Houston, Texas, or approved equal.
- B. Each secondary containment piping system shall be constructed of fiberglass-reinforced epoxy and shall be suitable for use with the products to be stored in the tank system. The piping system shall be UL-listed and approved for use in New York City by the New York City Fire Department. In addition, diesel and gasoline secondary containment piping systems shall be suitable for use with 100% methanol.
- C. Each fiberglass secondary containment piping and fitting joint shall be adhesive-bonded. The pipe and fittings shall have a minimum pressure rating of 100 psig.
- D. Each secondary containment piping system shall be designed and constructed to retain any leakage and to channel such leakage to a location equipped with an automatically monitored leak detection system. The secondary containment piping system shall provide 100 percent containment of the underground primary piping, including any underground flexible connectors.
- E. Centralizers shall be used to separate the primary and secondary piping as indicated on the Contract Drawings. Centralizers shall be compatible with the manufacturer, type, and size of the primary and secondary piping. Centralizers shall be as manufactured by Weaver Manufacturing, of Oroville, California, or approved equal.

2.03 BLACK STEEL PIPING AND FITTINGS

- A. Black steel piping and fittings shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of black steel piping and for each site. All black steel piping shall be as

manufactured by Wheatland Tube Company, of Collingswood, New Jersey, or approved equal.

- B. All black steel piping, unless otherwise specified, shall be standard weight, Schedule 80, ASTM A53, Grade B, welded black steel pipe. Each length of pipe shall be stamped with the trademark of the manufacturer. The pipe shall be free of flaws, blisters, cracks, and all other imperfections or defects that could impair its quality. All pipe shall be tested by the manufacturer under standard test pressure.
- C. Each fitting and pipe connection shall be screw-type, except where otherwise indicated on the Contract Drawings, or specified herein. Flanged connections shall be used where indicated on the Contract Drawings, or where approved by the Owner's Representative.
- D. All pipe threads shall be NPT standard, accurately and cleanly cut, without defects and flaws. Nipples shall be of the same material and weight as the pipe installed. The use of running nipples shall not be permitted.
- E. Each fitting, unless otherwise specified, shall be malleable iron, Class 150, with a working pressure of 300 psig at 150 degrees Fahrenheit. Each valve and fitting shall be as manufactured by Stockham Valves and Fittings, or approved equal.
- F. All black steel piping, fittings, pipe dope and other compounds used in joining the pipe and fittings shall be suitable for use with the petroleum fluids with which they are intended to be used. The pipe and fittings shall be approved for use in New York City by the New York City Fire Department.
- G. Each union shall have bronze to bronze seats and shall be furnished and installed adjacent to, and on, the downstream side of each threaded-end valve, and where shown on Contract Drawings, or as directed by the Owner's Representative.

2.04 GALVANIZED STEEL PIPING AND FITTINGS

- A. Galvanized steel piping and fittings shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of galvanized steel piping and for each site. All galvanized steel piping shall be Wheatland Tube Company, of Collingswood, New Jersey, or approved equal.
- B. All galvanized steel piping, unless otherwise specified, shall be standard weight, Schedule 80, ASTM A53, Grade B, welded galvanized steel pipe. Each length of pipe shall be stamped with the trademark of the manufacturer. The pipe shall be free of flaws, blisters, cracks, and all other imperfections or defects that could impair its quality. All pipe shall be tested by the manufacturer under standard test pressure.
- C. Each fitting and pipe connection shall be screw-type, except where otherwise indicated on the Contract Drawings, or specified herein. Flanged connections

shall be used where indicated on the Contract Drawings, or where approved by the Owner's Representative.

- D. All pipe threads shall be NPT standard, accurately and cleanly cut, without defects and flaws. Nipples shall be of the same material and weight as the pipe installed. The use of running nipples shall not be permitted.
- E. Each fitting, unless otherwise specified, shall be malleable iron, Class 150, with a working pressure of 300 psig at 150 degrees Fahrenheit. Each valve and fitting shall be as manufactured by Stockham Valves and Fittings, or approved equal.
- F. All galvanized steel piping, fittings, pipe dope and other compounds used in joining the pipe and fittings shall be suitable for use with the petroleum fluids with which they are intended to be used. The pipe and fittings shall be approved for use in New York City by the New York City Fire Department.
- G. Each union shall have bronze to bronze seats and shall be furnished and installed adjacent to, and on, the downstream side of each threaded-end valve, and where shown on Contract Drawings, or as directed by the Owner's Representative.

2.05 FLEXIBLE CONNECTORS

- A. Flexible connectors used in tank sumps shall be constructed of 300 Series stainless steel braid reinforcement and inner core. Flexible connectors shall be FIRE SAFE, all metallic connectors as manufactured by Titeflex Industrial Americas or approved equal.
- B. Flexible connectors that may come in direct contact with soils or backfill material shall be provided with an integral cathodic protection system. System shall provide minimum 30 years corrosion protection. Flexible connectors shall be SOIL SAFE 30 manufactured by Titeflex Industrial Americas, or approved equal.
- C. Each flexible connector shall be UL-listed and approved by the New York City Fire Department. Each flexible connector shall be constructed of a stainless steel innercore, encased in braided stainless steel reinforcement jacket, with carbon steel fittings. Each flexible connector shall be suitable for pressure or suction applications. Each flexible connector shall be constructed of materials compatible with the product to be stored in the tank system. In addition, diesel and gasoline flexible connectors shall be suitable for use with 100% methanol.
- D. Each flexible connector shall have a minimum pressure rating of 50 psig and shall be suitable for use with pressurized fuel delivery.
- E. Each flexible connector shall be constructed with at least one swivel fitting. The length of each flexible connector shall be sufficient to provide a flexible connection between the piping that will allow adequate movement of the pipes and adsorption of line shock during operation of the system, settlement, stresses on the pipes, etc.

2.06 VALVES

A. Mechanical Overfill Prevention Valve

1. Mechanical overfill prevention valves shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of mechanical overfill prevention valves for each tank. Each mechanical overfill prevention valve shall be OPW 61SOR Series vertical overfill valve, as manufactured by OPW Fueling Components, or approved equal.
2. Each mechanical overfill prevention valve shall be constructed of cast aluminum, with a stainless steel shaft and reinforced polyethylene float system. Each mechanical overfill prevention valve shall be suitable for use with the products to be stored in the tank system. In addition, diesel and gasoline mechanical overfill prevention valves shall be suitable for use with 100% methanol. Each mechanical overfill prevention valve shall be UL-listed and approved for use in New York City by the New York City Fire Department.
3. Each mechanical overfill prevention valve shall be suitable for use with gravity fuel delivery. Each mechanical overfill prevention valve shall be a gradual shut-off valve, designed to begin to restrict flow when product level reaches 90 percent of the tank capacity, and gradually increase flow restriction until the product level reaches 95 percent of the tank capacity. Each mechanical overfill prevention valve shall be designed to completely shut off flow to the tank when product level reaches 95 percent of the tank capacity. Each mechanical overfill prevention valve shall be adjustable so that these restriction and shut-off levels can be attained in the storage tank.
4. Each mechanical overfill prevention valve shall be fitted with a drop tube suitable for use with gravity fuel delivery. Each drop tube shall be sized to be compatible with the overfill prevention valve and the storage tank. Each drop tube shall be suitable for use with the products to be stored in the tank system. Each drop tube shall be EBW Model 782-204 Aluminum Drop Tube as manufactured by EBW Incorporated, or Universal Series 723 Submerged Drop Tube, as manufactured by Universal Valve Company, or approved equal.

B. Product Line Shear Valves

Product line shear valves shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of product line shear valves for each tank system. Each product line shear valve shall be constructed with two poppets, with a poppet in the lower main housing to prevent product loss from the tank side of the piping, and a second poppet in the upper housing to prevent product loss from the dispenser. Each product line shear valve shall be constructed of materials compatible with the product to be stored in the tank system. In addition, diesel and gasoline shear valves shall be suitable for use with 100% methanol. Each product line shear valve shall be constructed to

meet the standards set forth in NFPA 30, and shall be constructed of metals capable of withstanding temperatures specified in NFPA 30. Each product line shear valve shall be UL-listed and approved for use in New York City by the New York City Fire Department. Each product line shear valve shall be Universal Model 521DP Double-Poppet Safety Valve, as manufactured by Universal Valve Company, Elizabeth, New Jersey, or approved equal.

C. Ball Valves

Ball valves shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of ball valves for each tank. Each ball valve shall be constructed of a carbon steel body, a solid ball, a stainless steel stem, and double o-rings to prevent leakage. Each ball valve shall be constructed with seals and other materials that are suitable for use with the products to be stored in the tank system. In addition, diesel and gasoline ball valves shall be suitable for use with 100% methanol. Each ball valve shall have a 2000-psi W.O.G. pressure rating. Each ball valve shall be UL-listed and approved for use in New York City by the New York City Fire Department. Each ball valve shall be Jomar Model T-CS2000SS, as manufactured by Jomar International, Madison Heights, Michigan, or approved equal.

D. Solenoid Valves

Solenoid valves shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of solenoid valves for each tank. Each solenoid valve shall be constructed of a forged brass body, a bronze piston, and stainless steel internal metal parts. Each solenoid valve shall be constructed with a normally closed, hung piston. Each solenoid valve shall be constructed with seals and other materials that are suitable for use with the products to be stored in the tank system. In addition, diesel and gasoline solenoid valves shall be suitable for use with 100% methanol. Each solenoid valve shall be Snap-Tite GreenTop Model Z6214BB Solenoid Valve, as manufactured by Snap-Tite, Inc., Valve Division, Erie, Pennsylvania, or approved equal.

E. Angle Check Valves

Angle check valves shall be provided in the suction line tank. Each angle check valve shall be Morrison Model 137 Single Poppet Angle Check Valve, as manufactured by Morrison Brothers Company, Dubuque, Iowa, or approved equal.

F. Union Check Valves

Union check valves shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of union check valves for each tank system. Each union check valve shall have a brass stem, stainless steel spring, and a brass, 20-mesh screen, and shall be designed for installation in a union. Each union check valve shall be OPW Model 15S Single Poppet Union

Check Valve, as manufactured by OPW Fueling Components, Cincinnati, Ohio, or approved equal.

G. Vertical Check Valves

Vertical check valves shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of vertical check valves for each tank system. Each vertical check valve shall be constructed of a bronze body, a single brass poppet, an aluminum cage, and a brass screen, with a union connection on top. Each vertical check valve shall have a low-pressure drop through the valve, a removable cage for inspection and cleaning, and a self-aligning poppet for a tight seal. Each vertical check valve shall be OPW 93 Series Vertical Check Valve Model 615-302-1, as manufactured by OPW Fueling Components, Cincinnati, Ohio, or approved equal.

H. Foot Valves

Foot valves shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of foot valves for each tank. Each foot valve shall be of all metal construction, with a metal-to-metal seat and a stainless steel, 20-mesh screen. Each foot valve shall be Morrison Model 334 Single Poppet Foot Valve, as manufactured by Morrison Brothers Company, Dubuque, Iowa, or approved equal.

I. Anti-Syphon Valves (Type I)

Type I Anti-syphon valves shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of anti-syphon valves for each tank. Each Type I anti-syphon valve shall be constructed of cast-iron body with precision-machine valve seats. Each Type I anti-syphon valve shall be provided with the appropriate spring that provides for the proper operation of the anti-syphon valve at its intended location. Each Type I anti-syphon valve shall be Universal Model #403 Anti-Syphon Valve, as manufactured by Universal Valve Company, Elizabeth, New Jersey, or approved equal.

J. Anti-Syphon Valves (Type II)

Type II Anti-syphon valves shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of anti-syphon valves for each tank. Each Type II anti-syphon valve shall be of constructed of a bronze body with a dash pot for noiseless operation. Each Type II anti-syphon valve shall be UL-listed and approved for use in New York City by the New York City Fire Department. Each Type II anti-syphon valve shall be provided with the appropriate spring that provides for the proper operation of the anti-syphon valve at its intended location. Each Type II anti-syphon valve shall be shall be Preferred Utilities Type A Anti-Syphon Valve, as manufactured by

Preferred Utilities Manufacturing Corporation, Danbury, Connecticut, or approved equal.

K. Fire Shut Off Valves

Fire shut-off valves shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of fire shut-off valves for each tank. Each fire shut-off valve shall be constructed of a bronze body and disc, with a spring-loaded, lever-operated closing mechanism that is held open by a fusible link that is arranged so that the valve will automatically close if the link melts. Each fire shut-off valve shall be UL-listed and approved for use in New York City by the New York City Fire Department. Each fire shut-off valve shall be provided with the appropriate spring and fusible link that provides for the proper operation of the fire shut-off valve at its intended location. Each fire shut-off valve shall be Preferred Utilities Type 110 Fire Safety Fuel Shut-Off Valve, as manufactured by Preferred Utilities Manufacturing Corporation, Danbury, Connecticut, or approved equal.

2.07 STRAINERS

Strainers shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of strainers for each tank system. Each strainer shall be of all metal construction with a brass body and spring, and stainless steel, 20-mesh screen to filter out debris. Each strainer shall be Morrison Model 157 Suction Pipe Strainer, as manufactured by Morrison Brothers Company, Dubuque, Iowa, or approved equal.

2.08 VENT CAPS

Vent Caps shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of vent caps for each tank system. Each vent cap shall be of all metal construction, with a flame-retardant bronze, 40-mesh screen, and shall conform to NFPA 30. Each vent cap shall prevent water and contaminants from entering tank, and assure easy runoff from precipitation.

A. Primary Tank Vent Caps

Primary tank vent caps shall be provided where required by the Contract Drawings. Each primary tank vent cap shall assure even storage tank pressure during tank filling and product dispensing operations. Each primary tank vent cap shall be Universal Model #45 Upflow Vent, as manufactured by Universal Valve Company, Elizabeth, New Jersey, or approved equal.

B. Vent Whistle

Vent whistle shall be King Fill Alarms Model 4517 or approved equal.

2.09 EXTRACTOR FITTINGS

Extractor fittings shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of extractor fittings for each tank system. Each extractor fitting shall be constructed of a cast iron body with a corrosion resistant coating. Each extractor fitting shall include a bronze outer plug for normal operation, and a bronze inner plug for testing. Each extractor fitting shall be Universal Model #V421 Extractor Fitting with Model #V425 Test Plug, as manufactured by Universal Valve Company, Elizabeth, New Jersey, or approved equal.

2.10 FILL ADAPTER FITTINGS

Fill adapter fittings shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of fill adapter fittings for each tank system. Each fill adapter fitting shall be constructed of hard coated aluminum or bronze. Each fill adapter fitting shall be OPW 633T Series Top Seal Adapter with OPW Model 633LC Lock Clamp and OPW 634 Series Locking Fill Cap, as manufactured by OPW Fueling Components, Cincinnati, Ohio, or approved equal.

2.11 DRY DISCONNECT FILL FITTINGS

Dry disconnect fill fittings shall be provided where required by the Contract Drawings. The Contract Drawings show the number, size and location of dry disconnect fill fittings for each tank system. Each dry disconnect fill fitting shall be constructed of aluminum or stainless steel, with a metal spring and metal poppet. Each dry disconnect fill fitting shall be suitable for use with the products to be stored in the tank system. In addition, diesel and gasoline dry disconnect fill fittings shall be suitable for use with 100% methanol. Each dry disconnect fill adapter fitting shall be OPW 1611 AN-AL30 Series Poppetted Kamvalok Adaptor with OPW 1711 Series Locking Fill Cap, as manufactured by OPW Fueling Components, Cincinnati, Ohio, or approved equal.

2.12 FILL PIPE

Furnish and install submerged drop tube in fill line of each petroleum storage tank as indicated on Contract Drawings. Drop tube shall be EBW Model 782-204 Aluminum Drop Tube as manufactured by EBW Incorporated, or Universal Model 723 Submerged Drop Tube, or approved equal.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

3.01.1 Underground Storage System

- A. All fiberglass piping shall be installed in pea gravel, in accordance with the Manufacturer's recommendations, applicable codes, and as shown on Contract

Drawings. Pea gravel shall be placed in accordance with SECTION: FILLING AND BACKFILLING.

- B. Slope all suction and return lines towards tank sump at minimum of 1 inch per 8 foot of pipe, or as approved by the Engineer. Double swing joints of three elbows, or other flexible connectors acceptable to the FDNY Bureau of Fire Prevention, shall be provided in suction, discharge, vent and fill piping except that only a single swing joint shall be required at vertical riser of vent line.
- C. Provide each tank with separate vent pipe not less than 2 inches diameter, terminated outdoors in non-hazardous location, be well braced in position, at least 10 feet from nearest building opening, and provided with weather-proof hood having free area at least pipe size area. Vent pipes shall not be obstructed by devices that reduce its capacity, thus causing excessive back pressure. Vent pipes shall be run from tank to outer air higher than fill pipe opening and, for tanks located outside buildings, at least 15 feet above adjacent ground level.
- D. All pipes and valves, except where otherwise indicated, shall be arranged so as to be easily accessible for maintenance and repairs. No change in the general arrangement indicated on the Contract Drawings will be allowed unless approved by the Owner's Representative. Where lengths of pipe are finally assembled, the fittings shall be in correct alignment without forcing them into position.
- E. All pipes shall be cut accurately. Deformed or damaged pipe shall in no case be used. All bends shall be made with standard elbows and fittings. All threads shall be cleaned thoroughly and covered with suitable joint compound before joints are made. Every piece of pipe, valve, and fitting which is part of the pipe work shall be cleaned thoroughly before and, whenever possible, after installation.
- F. All piping shall be installed true to line and grade and be supported by suitable supports, spaced not more than 8 feet on centers. All such supports, anchors, clamps, or other devices shall be of standard design, simple in installation, and of an approved manufacturer.
- G. Hangers, brackets, supports, anchors, clamps, and other devices shall be hot-dip galvanized after fabrication and before assembly and installation. They shall be installed to make the entire pipe system self-supporting and rigid. Defective or inaccurately constructed hangers, brackets, supports, clamps and other hardware shall not be used. Machine bolts, 5/8 inch in diameter and of proper length, shall be used throughout for securing the hangers, brackets, clamps, and supports for pipes larger than 3 inches, and 1/2-inch diameter bolts for pipes 3 inches and smaller.
- H. Where required to use expansion bolts for securing supports and hangers, the holes in the masonry shall be drilled to the exact size of the bolts or sleeves. Packing shall not be used. Expansion bolts shall be of an approved type, diameter, and length.

- I. All flanged and mechanical coupling connections shall be made with bolts and nuts of the length and diameter required for the particular flange size as determined by the ANSI.
- J. Proper allowance for expansion and contraction shall be made. Wherever the pipe lengths required are to exact dimensions, and where lengths of pipe are finally assembled, the flanges and fittings shall be in correct alignment without forcing into position.
- K. Ball valves are required for all suction lines, and valve stems shall be vertical where possible and in no case below a horizontal position.
- L. The pipe to be installed shall be free of flaws, blisters, cracks, and all other imperfections or defects that would impair its quality. All pipe shall be tested by the manufacturer under standard test pressure.
- M. Pipe sleeves shall be standard weight, Schedule 40, galvanized steel pipe provided as required by the Contract Drawings.

3.02 FLEXIBLE CONNECTORS

The length of the flexible connector shall be adequate to relieve stresses due to movement, settlement, and shifting of the tank and piping, or due to vibration, traffic, etc., and shall be installed so as not to have less than the minimum bending radius of the connectors as recommended by the manufacturer. It shall not transmit excess stress to the threads of the associated fiberglass piping. When the connector is bent, it shall not be distorted out of shape, and its diameter shall not be constricted or obstructed.

Each flexible connector shall be installed such that both fittings and the entire length of flexible connector are inside the secondary containment sump and accessible for maintenance.

3.03 MECHANICAL OVERFILL PREVENTION VALVES

Each mechanical overfill prevention valve shall be installed and adjusted so that the valve begins to restrict flow when product level reaches 90 percent of the tank capacity, and gradually increases flow restriction until the product level reaches 95 percent of the tank capacity. Each mechanical overfill prevention valve shall be installed to completely shut off flow to the tank when product level reaches 95 percent of the tank capacity.

3.04 CUTTING OF CONCRETE OR MASONRY

Where necessary for the proper installation of piping, the Contractor shall cut away or break through concrete or brick masonry and, after installation of said pipes, he shall replace and refinish said masonry to the satisfaction of the Owner's Representative in accordance with these specifications.

3.05 TESTING

The piping systems of this Specification shall be tested as indicated on the Contract Drawings. Each test shall be performed in the presence of the Owner's Representative and a New York City Fire Prevention inspector. The Contractor shall provide water, air, and all labor, equipment, and accessories required to perform the tests at no additional cost to the Department of Design and Construction.

Defective pipes and fittings shall be replaced by the Contractor at his own expense with sound material. All joints examined during the tests and found to be leaking shall be caulked or otherwise be made satisfactory in the opinion of the Owner's Representative. Tests shall continue until a passing test is achieved. All test gauges shall be certified for accuracy.

All instruments other than test instruments shall be disconnected during testing to prevent damage.

END OF SECTION

SECTION 436000

INSTRUMENTATION AND CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, tools, and equipment, and install all instrumentation and controls associated with all new or upgraded Petroleum systems as required by the Contract Drawings.

1.02 APPLICABLE STANDARDS

All instrumentation and control equipment shall comply with the following standards and all other applicable federal, state, and New York City Building Codes including revisions to the date of Contract.

NFPA	National Fire Protection Association
ANSI	American National Standards Institute
ASTM	American Society of Testing Materials
ASME	American Society of Mechanical Engineers
NEC	National Electric Code
ISA	Instrumentation Society of America
NEMA	National Electrical Manufacturers Association

1.03 SUBMITTALS

A. Shop Drawings:

1. Wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will function properly as a unit.
2. Equipment and instrument list, including size, input/output types, expected range of operation, utility requirements, and materials of construction. A Bill of Materials also shall be included and keyed to the drawings. The Bill of Materials shall provide sufficient information to determine compliance with the Contract Drawings and Specifications.
3. Drawings showing the proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of work, including clearances for maintenance and operation.
4. Manufacturers' descriptive and technical literature, including catalog cuts.
5. Legends for name plates.
6. Equipment certifications and test reports.

7. Control panel and enclosure drawings providing arrangements, dimensions, cabinet door swing radius and terminations for all panels.
- B. Spare Parts Data: Within 30 days of Shop Drawing approval, the Contractor shall furnish spare parts data for each different item of material and equipment specified. Data shall include a complete list of parts and supplies, with current unit prices and a source of supply. A list of all special tools required for installation, maintenance or repair of equipment shall be provided.

The Contractor shall furnish those spare parts and special tools which are recommended by the manufacturers. The Contractor also shall provide a 12-month supply of any expendable items and frequently replaced parts as identified by the manufacturer.

- C. Operating and maintenance instructions shall be provided for each different type of control, instrument, and system.
 1. The Contractor shall furnish to the Owner's Representative three (3) complete copies of the operating instructions outlining the procedures required for equipment and system start-up, operation, and shut-down. The instructions shall include the manufacturer's name, model number, service manual, parts list, and a brief description of all equipment and their basic operating features.
 2. The Contractor shall furnish to the Owner's Representative three (3) complete copies of maintenance instructions listing routine maintenance procedures, possible breakdown and repairs, and troubleshooting guide
- D. Performance Test Reports: Upon completion and testing of the installed system, test reports shall be submitted in booklet form showing that all field tests are performed to adjust each component and that all field tests are performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of the controls.

1.04 MANUFACTURER'S SERVICES

- A. The Contractor shall provide the services of a manufacturer's representative who is experienced in the installation, adjustment, and operation of the instruments and controls specified shall be provided. The representative shall provide a site specific wiring diagram of all the Veeder Root components.
- B. The leak detection/inventory control system shall include a minimum five-year extended service contract for the entire system that includes on-site replacement of parts, programming, and testing of system features. This extended service contract will go into effect at the end of the construction warranty period. The extended service contract shall be between the manufacturer's authorized service contractor (a

third party) and the City. The contractor shall obtain this extended service contract and shall submit it to the Owner's Representative at substantial completion.

1.05 FIELD TRAINING

- A. The Contractor shall provide a field training course for the Project Manager and his designated operating staff. Training shall be provided for a total of 24 hours of normal working time, and shall be completed prior to the system's final acceptance by the Project Manager. Field training shall cover all of the items contained in the operating and maintenance manuals.
- B. The Manufacturer or their consulting engineer shall provide to the Owner an EPA Operators Training program consisting of site specific block diagram showing all leak detection devices, alarms and stop switches, an owner approved alarm protocol, and a 4 hour site specific class for training and inspection. The block diagram and the alarm protocol will be 30" x 24" and permanently installed near leak detection console.

PART 2 - PRODUCTS

2.01 GENERAL

The general instrumentation requirements are identified on the Contract Drawings. All instruments and control equipment shall conform with the following general provisions.

- A. All equipment in a system shall be compatible in function and appearance. Provisions shall be made, where necessary, for signal dampening to suppress noise and spurious electrical signals in order to provide the desired degree of performance.
- B. All instrument supports and interconnecting wiring and conduit shall be as recommended by the manufacturer and approved by the Owner's Representative.
- C. Identifying tag number for each instrument shall be permanently etched or embossed onto a durable tag which shall be fastened to the device housing with stainless steel rivets or self-tapping, stainless-steel screws of appropriate size. Where neither of the above fastening can be accomplished, tag number nameplates shall be permanently attached to the device by a circlet of stainless-steel wire.
- D. All instruments and devices furnished under this Section requiring electrical power shall be suitable for operation on a 120 Volt $\pm 10\%$, 60 Hertz ± 2 Hertz supply.
- E. All instruments shall return to accurate measurement upon restoration of power after a power failure.
- F. Unless otherwise noted, all instruments in contact with a process stream shall be furnished with diaphragm seals.

- G. Instruments shall be guaranteed to maintain the characteristics listed herein and under conditions listed and shall meet the following specifications, except where otherwise noted:
1. Accuracy: $\pm 1\%$ of span
 2. Repeatability: $\pm 0.1\%$ of span
 3. Dead Band: $\pm 1\%$ of span (where applicable) in accordance with ISA Standard S50.1
 4. All signal generators and transmitters shall be capable of operating at a load of 600 ohm in accordance with ISA Standard S50.1, higher when specified. Signals shall be output isolated.
 5. All electronic instruments shall be solid-state and shall be capable of operating throughout the temperature range of 10 degrees Fahrenheit to 110 degrees Fahrenheit, unless otherwise specified.
 6. Temperature effect on calibration shall be not more than 1% over a temperature change of 100 degrees Fahrenheit.
- H. The ranges and scales shall be as per specified, shown on the Contract Drawings, or approved by the Owner's Representative.
- I. Where separate measuring elements and transmitters are required, they shall be fully matched and any special cables or equipment required must be supplied for installation.
- J. The Contractor shall be responsible for the matching of electrical characteristics of instruments and shall supply transmitters with ample signal output capacity. Additional signal generators or repeaters shall be avoided if possible, but must be supplied if necessary.
- K. All equipment, unless otherwise specified, shall be furnished in the manufacturer's standard enclosure for the service indicated by the equipment location.
- L. All miscellaneous necessary work required to complete installation shall be included. This work includes, but is not limited to, bolts, nuts, studs, gaskets, pipe tapping, holes through walls, and repair.
- M. Electrical control conductors shall be No. 14 AWG or larger. Conductors larger than No. 14 shall be used where herein specified, or where indicated on the Contract Drawings.
- N. The size of the conductors and other current-carrying parts of switches and control equipment shall be ample for the rating of the devices to which they are to be connected for service, without undue heating. In no case shall the current density exceed 1,000 amperes per square inch of cross-section. At contacts, the current density shall not exceed 150 amperes per square inch.

2.02 LEAK DETECTION/INVENTORY CONTROL SYSTEM

A. The leak detection/inventory control system shall include all parts, equipment, and software necessary for a complete system. All software, firmware, and hardware shall be of the latest revisions at the time of contract signing and/or requisition placement. The leak detection/inventory control system shall include, but not be limited to the following:

1. Monitoring head/system controller (per site)
2. Magnetostrictive technology type, inventory control and in-tank leak testing probe assembly (one per tank, as required)
3. Annular space liquid sensing probe for interstitial space (one per double-wall tank, as required)
4. Magnetostrictive sensor for manway sump/transition sump (one per sump, as required)
5. Overfill alarm with acknowledgment switch (one each per tank, as required)
6. Stick gauge calibrated in inches (one per tank)
7. VGA LCD 7.4 inch touch screen (one per site)
8. Direct Access, Total Access, and Total Control software package (one per site)
9. Capability of 3 year back up reports for alarms, compliance, inventory and level readings
10. Capability of BIR Automatic reconciliation
11. AccuChart II™ automatic tank charting program (one per site)
12. Ethernet TCP/IP connection (one per site)
13. Fax modem (one per site)
14. CSLD software package (one per site)
15. PLLD electronic line leak detection
16. Vacuum monitor sensor kits for double wall pipe (one per tank)
17. BIR LVDIM 12 inputs factory installed (per site)
18. BIR MDIM 12 inputs factory installed (per site)

19. Phase separation detection float kits for Ethanol fuels
 20. Fuel density robes for diesel
 21. EMR3 with Mass Flow Meters for heating oil and emergency generators
 22. 4-20 millimap communication package (one per site)
 23. 5 dry contact module (two per site)
 24. Networked command center allowing web browser for PC and PDA (one per site)
 25. System shall be capable of 32 tank probes or 64 sensors
 26. System shall provide consolidated monthly reports on all tanks, lines and sensors
 27. System shall be capable of remote monitoring for all sites installed or upgraded
 28. System must provide a tank test performance guarantee for all USTs
 29. Alarm response 24 hours a day 7 days a week
 30. System shall be capable of producing Code Official's report
 31. System shall be capable of notifying detailed personnel via email according to alarm condition and type, archives alarm reports continuously, providing instant access to consolidated alarm history, and providing protocol for each individual alarm
 32. Modbus (one per site)
- B. The controller shall be capable of performing in-tank leak detection functions, business inventory reconciliation (BIR) functions, automatic tank calibration and charting, and external leak detection functions. The controller shall be completely compatible with all probes and sensors. The controller shall have LCD light groups identifying inventory, system status, setup, and diagnostics. The controller shall be supplied with an integral printer. The controller shall be supplied with an internal telephone fax/modem/dialer. The fax/modem shall be capable of dialing a pre-programmed telephone number at operator specified alarm or inventory conditions. The controller shall include all software and interface modules required for probes, sensors, alarms, modems, and other input/output devices required for a complete system. The controller shall be a model TLS-450R (BIR) Monitoring Head/System Controller with Integral Printer, Model 860-090-100, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.

- C. The inventory control and in-tank testing probe assembly shall be of the magnetostrictive technology type. The in-tank probe shall be capable of measuring product level in the tank in inches, and detecting the presence of water in the tank. The probe shall be capable of performing the 0.1 gallon per hour volumetric tank tightness testing and 0.2 gallon per hour automatic tank gauging in the tank system. The probe shall meet NEC, NFPA, and UL requirements for hazardous locations. Probe electronics shall be capable of operating from -20 Celsius to +50 Celsius. The in-tank probe assembly shall include 4-inch floats and 4-inch sealed riser cap and ring. Each probe shall be completely compatible with the fluid to be stored in the tank. The probe shall be Series 8473 MAG1 Magnetostrictive Probe with 4-inch Float Kit, Model No. 847391, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal. The probe assembly shall also include Magnetostrictive Probe Installation Kit, Model No. 849600, and Riser Cap and Ring Kit, Model No. 312020-952, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.
- D. The annular space liquid sensing probe shall be capable of detecting and differentiating between liquid hydrocarbons and other liquids in the interstitial space between tank walls. The probe shall meet NEC, NFPA, and UL requirements for hazardous locations. Probe electronics shall be capable of operating from -20 degrees Celsius to +70 degrees Celsius. Annular space sensor shall be Series 857080-212 Discriminating Interstitial Sensor, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.
- E. The manway sump sensing probe shall be capable of detecting and differentiating between liquid hydrocarbons and other liquids in the manway containment sump. The probe shall meet NEC, NFPA, and UL requirements for hazardous locations, and shall be capable of withstanding the harsh environment and wide temperature ranges possible in the intended location. Containment sump sensor shall be Series 857080-212 Discriminating Interstitial, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.
- F. The overfill alarm shall be the audible horn and flashing light type. The overfill alarm shall be supplied with an alarm acknowledgment switch. Alarm electronics shall be capable of operating from -40 degrees Fahrenheit to +150 degrees Fahrenheit. The alarm and acknowledgment switch shall be Series 7900 Overfill Alarm and Alarm Acknowledgment Switch, Models No. 790091-001 and 790095-001, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal. Controller shall be equipped with Four-Relay Output Interface Module, Model No. 329359-001, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.
- G. The pulser/totalizer shall be capable of totalizing product flow through the hose assembly in the dispenser, and sending a signal back to the controller. The pulser/totalizer shall be capable of performing business inventory reconciliation (BIR) functions. The pulser/totalizer shall be compatible with the dispensers. The controller shall be equipped with an interface module compatible with the pulser/totalizer. The pulser/totalizer shall be Model 787491-003, Mechanical Dispenser Pulse/Totalizer, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal. Controller shall be equipped with Mechanical

Dispenser Interface Module (DIM), Model 330250-001, as manufactured by Veeder-Root, of Simsbury, Connecticut, or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

- A. Installation of all equipment shall be in accordance with the New York City Building Code and the New York City Electrical codes. The Contractor shall furnish and install all required conduit sealing fittings, explosion-proof accessories, and NEMA Type 7 enclosures where indicated on the Contract Drawings, or where required by Code, or both.
- B. Instrumentation and control equipment shall be installed as indicated on the Contract Drawings or as indicated by the Owner's Representative. All power and control wiring and connections not specifically indicated on the Contract Drawings, but required for the proper operation of equipment shall be made by the Contractor in accordance with these Specifications. All electrical control and instrumentation equipment installed in Class 1 hazardous locations shall be installed in NEMA Type 7 enclosures. Conduits and wireways leading to and from these areas shall be provided with sealing fittings. All non-conducting metal parts of switches and controls, shall be rust-proofed by galvanizing, cadmium plating, baked enamel or by the use of a non-corroding metal. Springs, wherever used, shall be a phosphor bronze. Contacts shall close fully at a line voltage of 10% below normal.
- C. Each leak detection inventory control system shall be installed, programmed and adjusted in accordance with the manufacturer's instructions so that all components function properly. Each overfill alarm and alarm acknowledgement switch shall be programmed and adjusted so that the alarm is activated at 90 percent of the tank capacity.
- D. Provide all necessary labor and equipment to print out Veeder-Root "Accuchart" tank chart at completion of 56-day calibration process. The Contractor shall submit a minimum of three (3) charts to the Owner.

3.02 TESTING

- A. General: All equipment (hardware and software) shall be factory and field tested to demonstrate that it provides the specified functions.
- B. The factory and onsite test procedures shall be submitted to the Owner's Representative for approval prior to starting the actual tests.
- C. The onsite testing shall include checking of cables, testing of system subassemblies and checking of connections for each component and for the entire instrumentation and control system.

- D. The Contractor shall notify the Owner's Representative in writing that he is ready and desires to start the on-site system testing. The Owner's Representative will authorize start of the testing at a mutually-agreed starting date.
- E. Shop Testing: All activating devices, instruments and assemblies furnished under this item shall be set up in the shop of the manufacturer and tested over the full range of the equipment. The equipment shall satisfactorily perform all the functions within the requirements of the specifications.
- F. Field Testing: All instruments and systems shall be field tested to ensure conformance with the Specifications. Control systems shall receive dynamic loop tests which shall conform to the intent of ANSI: MC4.1 (ISA-S26). The control systems and equipment shall include provisions for such testing.
- G. Input signals for equipment control shall be simulated for at least 5 signal values from 0 to 100 percent signal, with corresponding equipment response to be manually recorded, and adjustments made as required. Output signals from the equipment shall be read for at least 5 signal values from 0 to 100 percent of the meaningful process values, and adjustments shall be made as required.
- H. All instruments used for control functions shall be tested with the final elements in the circuit in addition to simulated control methods. The Contractor shall adjust instruments and/or final elements to obtain the best working conditions for a dynamic system.

END OF SECTION

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**SECTION 441136
VACUUM EXTRACTION SYSTEM**

PART 1 - GENERAL

1.1 DESCRIPTION

Provide all materials, equipment, and labor needed to install complete and ready for use, exhaust blower, equipment enclosure and all pipe and pipe fittings in accordance with the Contract Documents.

1.2 SUBMITTALS

The Contractor shall prepare and submit to the Engineer certificates of compliance on materials furnished and manufacturer=s brochures containing complete information and instructions pertaining to the storage, handling, installation, inspection, maintenance, and repair of each type of pipe and pipe fitting furnished.

1.3 STATUTES, REGULATIONS, CODES AND POLICIES

All work included in this contract shall be conducted in strict compliance with all applicable Federal, State and Local statutes, regulations, codes and policies. Compliance assurance shall be the responsibility of the Contractor.

PART 2 - MATERIALS

2.1 EXHAUST BLOWER

- A. Manufacturer: AMETEK Rotron TMD, or approved equal
- B. Model: EN6F72L or approved equal
- C. Fluid to be pumped: Soil Vapor
- D. Motor: 5Hp, explosion proof, 3 phase, 230V, 60Hz
- E. Capacity: 193 cfm @ 20 in H₂O vacuum

2.2 EXHAUST BLOWER INLINE MUFFLER

- A. Manufacturer: AMETEK Rotron TMD, or approved equal

- B. Part Number: 551377
- C. Materials of Construction:
 - 1. Housing: Steel
 - 2. Media: Acoustical Material
- D. Connections: Inlet-2 inches, Outlet-2 inches

2.3 EXHAUST BLOWER OUTLET MUFFLER

- A. Manufacturer: AMTEK Rotron TMD, or approved equal
- B. Part Number: 523623
- C. Materials of Construction:
 - 1. Housing: Steel
 - 2. Media: Acoustical Material
- D. Connections: Inlet-2 inches

2.4 EXHAUST BLOWER ENCLOSURE

- A. Manufacturer: Hotbox or approved equal
- B. Model: LB6000AN
- C. Materials of Construction: Mill finished Aluminum, ASTM B209
- D. Size: 62"L X 39"W X 46"H (approximate interior dimensions)
- E. Mounting Hardware: Stainless Steel

2.5 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

- A. All slotted pipe shall be Schedule 40 PVC conforming to ASTM D-1785. Four inch pipe shall have 4 rows of slots spaced 90 degrees apart (on center) as manufactured by Plastinetics, Chemtrol, CertainTeed, or approved equal. Pipe and fittings shall be the product of a single manufacturer. Slot length shall be 2.6 inches minimum, slot width shall be 0.04 inches, and slot spacing of 0.50 inches.
- B. All solid PVC pipe and pipe fittings shall be Schedule 40 PVC conforming to ASTM D-1785 for pipe and ASTM D-2466 for fittings.
- C. PVC pipe and pipe fittings shall be manufactured from a compound which meets the requirements of Type 1, Grade 1 Polyvinyl chloride as outlined in ASTM D-

1785. A Type 1, Grade 1 compound is characterized as having the highest requirements for mechanical properties and chemical resistance. Pipe and pipe fittings shall be manufactured by Plastinetics, Chemtrol, CertainTeed, or approved equal. Compound from which pipe is produced shall have a design stress rating of 2,000 psi at 73EF, listed by PPI.

- D. Materials from which pipe and pipe fittings are manufactured shall have been tested and approved by the NSF.
- E. Pipe shall conform to the requirements of ASTM D-2241. Pipe shall be homogenous throughout and shall be free from cracks, holes, foreign inclusions, and other defects.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of all materials and equipment shall be completed in a professional manner using craftsmen skilled in their respective trades. The Contractor shall provide work that has a neat and finished appearance.
- B. Installation shall be in accordance with the manufacturer's instructions and approval after inspections and prior to operation. The Contractor shall keep a copy of the manufacturer's installation instructions available on the job site at all times for review. The Contractor shall notify the Construction Manager of any conflict that arises between the manufacturer's instructions, codes or regulations and the Contract Documents.

3.2 PVC PIPE HANDLING

- A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into the excavation. Pipe and pipe fittings shall not be dropped or dumped.

3.3 PVC PIPE INSTALLATION

- A. PVC pipe installation shall conform to these Specifications, the manufacturer's recommendations, and as outlined in ASTM D-2774.

- B. Unless otherwise specified, all piping located beneath the Administration Building and Central Storage Structure shall be of the slotted PVC type. Piping located outside of the Administration Building and Central Storage Structure or located above grade shall be solid PVC.

3.4 JOINING OF PVC PIPES

- A. Joining of pipes shall be in accordance with ASTM D-2855.
- B. All pipe shall be inspected for cuts, scratches, or other damages, prior to installation. Pipe with imperfections shall not be used.
- C. All burrs, chips, etc., shall be removed from pipe interior and exterior.
- D. All loose dirt and moisture shall be wiped from the interior and exterior of pipe ends and the interior of the fitting.
- E. All pipe cuts shall be square, perpendicular to center line of pipe except as noted on the Drawings.
- F. Pipe ends shall be beveled prior to applying primer and solvent cement so that the cement does not get wiped off during insertion into the fitting socket.
- G. A coating of CPS primer as recommended by pipe supplier shall be applied to the entire interior surface of the fitting socket and to an equivalent area on the exterior of the pipe prior to applying solvent cement.
- H. The solvent cement shall comply with the requirements of ASTM D-2564 and shall be applied in strict accordance with manufacturer=s specifications.
- I. Except as noted below, pipe shall not be primed or solvent welded when it is raining or when atmospheric temperature is below 40EF or above 90EF when under direct exposure to the sun. For solvent welding when the atmospheric temperature is below 40EF, use RectorSeal Primer, or approved equal, as a primer, and RectorSeal Arctic 616, or approved equal, as the solvent cement. Weld as per manufacturer=s recommendations and product data sheets for installation and set times.
- J. After solvent welding, the pipe shall remain undisturbed prior to backfilling until cement has thoroughly set. As a guideline for joint setting time, use 1-hour for ambient temperatures of 60-100EF, or 2 hours when ambient temperatures are 40-60EF.

- K. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and pipe fittings which do not fit together to form a tight fitting will be rejected.

END OF SECTION

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January 27, 2006

Dean/Wolf Architects
40 Hudson Street,
New York, NY 10013

Attn: Mr. Charles Wolf

Re: Geotechnical Investigation Report
Queens Hospital EMS Station
159th Street and Goethals Avenue,
Queens, NY
FTC Job No.: DWA106

Dear Mr. Wolf:

Pursuant to your request, Future Tech Consultants of New York Inc. (FTC) has completed a geotechnical analysis of the boring data you submitted to us for the above referenced project and is pleased to present our findings and recommendations for the design and installation of foundations for support of the proposed building.

1. PROJECT AND SITE DESCRIPTION

The project site, which is an elevated lot or hill surrounded by concrete retaining walls and driveways, is located on the south side of Goethals Avenue between 159th St. and 160th St. in Queens, New York. Currently the site is partially wooded and partially occupied by metal trailers. The remaining area is grass field.

Information provided by the client indicates that an underground utility tunnel traverses through the project site in a L-shaped form, connecting a 3-story brick building at the northeast corner of the site to a 2-story brick building at the southwest corner of the project site. According to the survey plan, the top of the tunnel is about 4' to 6' below grade (elevations 99' to 104'), sloping up from northeast to southwest. There is no information indicating the bottom of the tunnel, which is estimated to be approximately 14'-16' below grade, or elevation 88' to 90'.

Conceptual plan indicates that the proposed construction consists mainly of one-story building with superstructure of second floor in one portion. No detailed structural loading information was available at the time this report was prepared.

2. BORING DATA

FTC was provided with a boring report and results of laboratory testing, prepared and certified by Matrix Engineering Services, P.C. of East Hanover, New Jersey and dated November 30, 2005, which contained 9 boring logs (QH1 to QH9). No soil samples from these borings were submitted to FTC for review.

According to the said boring logs, borings QH2 thru QH4 and QH8 were advanced to 102' below grade. The rest of borings (QH1, QH5 thru QH6, and QH9) were drilled to a depth of 52' below grade.

In addition to the borings, piezometer well was installed at borings QH-3, QH-4 and QH-8 for groundwater observation purpose. Groundwater table measured in the piezometer wells was recorded on the boring logs.

3. SUBSURFACE CONDITIONS

The following provides our interpretation of the subsurface conditions inferred from the test borings.

3.1 Soil Profile

Below the surficial features of asphalt and concrete, most of the nine borings encountered 3'-18' of miscellaneous fill, which was classified as NYC 11-65 class according to the boring report.

Below the fill, the test borings encountered predominantly coarse-medium-fine to fine sand with trace to some amount of silt, gravel and/or boulders, which extended to the maximum depth of the exploration at 102' below grade. The sand is typical of glacial sediments deposited in the area and is consistent with SM/SP Group of Unified Soil Classification System (USCS) or 7-65/6-65/8-65 class of NYC classification system. Based on the SPT values, the density of the sand was found to range from medium dense to very dense.

3.2 Groundwater

According to the said boring report, groundwater was detected and measured in the piezometer wells at depths ranging from 75.8' to 86.1' below existing grade (corresponding to elevations of 22.9' to 19.9'). It should be pointed out that groundwater table will fluctuate with seasonal, tidal and climatic conditions.

4. DISCUSSION AND RECOMMENDATIONS

4.1 Foundation Design Criteria

The borings indicate a general profile of 3'-18' of miscellaneous fill, followed by natural glacial sands to the maximum depth of the exploration. The fill material is NYC 11-65 class and is unsatisfactory for support of building foundations. No footings should be supported on existing

fill material. The glacial sand soil of 7-65 class that underlies the fill stratum is suitable for support of building foundations.

Based on the soil and tunnel profiles established above, we suggest the following foundation supporting alternatives for consideration.

4.1.1 Option A - Spread Footings

The proposed building may be supported on spread footings bearing on natural glacial sands of 7-65 class. The depths to glacial sand stratum, which vary with boring locations, are summarized in the following table, based on the said boring report.

Boring No	Ground Surface Elevation (ft.)	Elevations to natural glacial sand stratum (ft.)
QH1	113.8	95.3
QH2	113.4	99.9
QH3	108.4	89.9
QH4	106.0	97.5
QH5	103.5	94.9
QH6	101.6	88.1
QH7	100.6	87.1
QH8	98.7	85.2
QH9	99.8	91.3

Spread footings supporting on natural sand soil of 7-65 class may be designed for a maximum allowable bearing capacity of 3 tsf.

To prevent from local shear failure, the footings should have a minimum width of two (2) feet for strip/wall type and four (4) feet for individual column type.

In addition to the above design criteria, all spread footings must extend below the influence line of the existing tunnel in order to be independent of the tunnel. The influence line of the tunnel should be defined as a line drawn from the outer-edge of the tunnel extending outward at a 2:1 slope (H:V).

Footings designed and constructed in accordance with the above recommendations should yield settlement within tolerable limits of the proposed construction.

All footing subgrade should be subject to control inspection as per NYC Building Code by a qualified soil engineer prior to placing steel reinforcement and concrete. Any unsuitable bearing material encountered within the footing subgrade must be removed and replaced with controlled compacted fill.

4.1.2 Option B - Pile Foundations

The installation of spread footings will involve excavation and removal of the existing fill material, which reportedly may have contained contaminants with levels exceeding New York

State Clean Up Standards, and thus may require extensive testing, abatement, and disposal once it is exposed.

If the extent of such excavation and disposal operation is to be minimized, one may consider supporting the proposed building on pile foundations.

Two types of piles, namely driven piles, including H piles and open-end pipe piles, and drilled piles such as Auger-Cast-In-Place piles and Micropiles, are considered in our analysis. Each piling system has its advantages and disadvantages. The selection of proper pile system will depend on the cost, time constraint, and environmental factors.

A. Open-end steel pipe pile or steel H pile

From geotechnical standpoint, both steel H pile and open-end steel pipe piles are non-displacement piles and can be considered for use at this site due to its minimal disturbance to the existing tunnel.

Our analysis suggests that a 10" deep H pile or a 10" diameter steel open pipe can achieve an allowable compressive bearing capacity of 30 tons, when penetrating to minimum depths of 40'-55' below existing surface grade (25' - 35' below bottom of tunnel). Larger or wider sections such as 12" H pile or 12" diameter open-end piles may be considered if shallower penetration depths are desired.

Although it is possible to design and install steel H or open-end pipe piles to higher capacities than 30 tons, it is probably most advantageous to limit the pile capacity to 30 tons in order to avoid the need for pile load test.

Both types of piles should be driven, with a hammer capable of delivering a rated energy between 12,000 and 20,000 ft.-pounds, to the designed capacity as determined in accordance with Engineering News Formula.

B. Auger-Cast-In-Place Pile (ACIP)

Auger cast-in-place pile is a drilled pile, generating little to no vibration and noise. It involves augering a test hole of specified diameter in the ground to a predetermined depth, and then backfill the hole with pressure grout or concrete. The grout or concrete impregnates the surrounding soil and develops skin friction once it hardens. One drawback of this system is that quality control of the pile installation may be difficult because all auger cast-in-place piles are to be drilled to the same depth even the subsurface conditions may vary with locations.

Based on the boring data, our analysis indicated that auger cast-in-place pile of 12" diameter could develop an allowable bearing capacity of 30 tons when installed to depths of at least 20' below the tunnel influence line and at least 20' into the natural sand stratum. Portion of the pile shaft above the influence line may need to be cased to ensure stress free. Since ACIP is a friction pile, its design capacity needs to be verified by load tests.

C. Micropiles

An alternative to auger cast-in-place pile is Micropile. Micropile is generally smaller diameter than ACIP and is installed in a manner similar to ACIP pile except that steel casing is used for

advancing the pile hole instead of the hollow stem auger and that the steel casing is often left in place in a zone where free-bonding is required after the drilling is completed. Grouting for micropile is installed under high pressure, resulting in better friction resistance along the pile shaft and thus higher capacity.

Micropiles are generally installed as performance specifications with contractor responsible for design, installation and quality assurance. For this reason, micropile is generally more expensive than other type of piles.

Based on the boring profile obtained for this site, we estimate that a micropile of 8" in nominal diameter can be designed for an allowable bearing capacity of 30 tons when installed to minimum depths of 30'-40' below grade (15'-20' below the bottom of tunnel). The portion of the pile above the influence line shall be cased. Micropile is a friction pile, thus requiring load test.

4.2 Seismic Design Considerations

The project site is located in a seismic zone with a zone factor of 0.15. Based on the test boring data obtained during this investigation, the soil profile below the footings may be classified as S₂ Type, having a site coefficient of 1.2. Please refer to NYC Building Code for additional seismic-related criteria for foundation design.

4.3 Liquefaction Potential

Since groundwater was encountered at depths well below 50', the liquefaction potential of the in-situ soils is not a concern, according to Referenced Standard 9-6 of the NYC Building Code, and therefore needs not be considered.

4.4 Ground Floor Slabs

Where ground floor slabs fall within the influence zone of the existing tunnel, they should be designed as a structural slab to be supported on grade beams and footings or pile caps.

Where ground floor slabs fall outside the influence zone of the tunnel, they may be designed as a structural slab or as a slab-on-grade bearing on controlled compacted fill provided the following recommendations are observed.

- Floor slabs are to be supported on at least 2' of controlled compacted fill including 6" of crushed stone. This will involve undercutting and removing at least 2' of existing fill material from within the slab-on-grade area and backfilling it with controlled compacted fill.
- The undercut subgrade should be rigorously proofrolled and densified prior to receiving control fill and crushed stone course.
- Any unstable and/or unsuitable bearing material encountered during the proofrolling should be removed and replaced with controlled compacted fill.

- Control fill should meet the grading requirements as stipulated in the NYC Building Code and should be placed in 12" loose lifts with each lift being compacted to at least 95% of the maximum dry density as determined in accordance with ASTM D-1557.

4.5 Dewatering

Dewatering the site is not required due to the deep groundwater table. As a general practice, however, sump pump capability should be provided on site during the course of excavation and foundation installation to control surface water.

5. LIMITATIONS

The conclusions and recommendations contained in this report are based on the subsurface data prepared by others and on the details stated in this report. Should conditions be encountered which differ specifically from those stated in this report, we should be notified immediately so that our recommendations may be reviewed and/or revised, if necessary.

6. CONSTRUCTION CONSULTATION AND INSPECTION

Due to the nature of the soils and subsurface conditions at this site and the recommendations set forth herein, consultation and inspection services by a qualified soil engineer are recommended for the following:

1. Preparation of the site, including clearing, excavation of basement, and initial proofrolling and compaction of the in-situ soils.
2. Placement of all controlled backfill and/or fill, if any.
3. Footing subgrade inspection and/or Pile installation inspection.
4. Pre-construction survey of existing and adjacent structures.

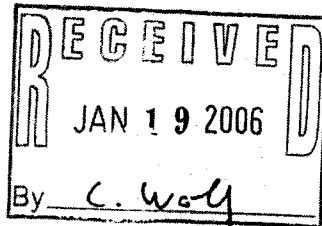
We trust the above information will allow you to proceed with the design and construction of the proposed EMS Station building.

We thank you for the opportunity of providing this service to you. Should you have any questions regarding this report, or if we can be of further assistance, please do not hesitate to contact us.

Respectfully Submitted
Future Tech Consultants of New York, Inc.

Steve J. J. Lin, P.E.

City of New York City
Department of Design and Construction
Bureau of Environmental & Geotechnical Services



UTILITY INVESTIGATION
NEW QUEENS HOSPITAL EMS FACILITY
BOROUGH OF QUEENS

FMS I.D.: 175QUEEN
SES No. 3653A

Matrix Engineering Services, P.C.
120 Eagle Rock Avenue, Suite 207
East Hanover, NJ 07936

January 11, 2006

**Utility Investigation
New Queens Hospital EMS Facility
Borough of Queens**

CONTENTS

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PROJECT DESCRIPTION.....	1
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Table 1 – Depths of Geoprobes

Figure 1 – Geoprobe Location Plan

Figure 2 – Utility Tunnel Profile

**Utility Investigation
New Queens Hospital EMS Facility
Borough of Queens**

Description of Work

At the request of the New York City Department of Design & Construction (DDC), Bureau of Environmental & Geotechnical Services (BEGS), Matrix Engineering Services, P.C. (Matrix) provided oversight of the performance of geoprobes to investigate the location of utility tunnels in the area of the planned new EMS Facility at Queens Hospital, located on Goethals Avenue, in the Borough of Queens. The work was performed under Matrix's Contract for Geotechnical Inspection Services for Various Capital Projects with the BEGS.

The BEGS provided Matrix with a plan showing the proposed location of the geoprobes along the anticipated location of existing utility tunnels in the area of the plan EMS facility. On December 8, 9, and 10, Matrix provided oversight of the geoprobes, which were performed by Aquifer Drilling & Testing, Inc., which has contract with BEGS for soil borings and other services.

The as-drilled locations of the geoprobes are shown on Figure 1. The depths of the geoprobes are shown on Table 1. The top of the utility tunnels were anticipated to be about eight feet below ground. If the geoprobes met refusal within eight feet, it is anticipated that they encountered the utility tunnel. If the probes went deeper than approximately eight feet, the tunnel is likely not beneath that location. A profile of the top of the tunnel was developed and is shown on Figure 2. The profile was developed using the following methodology:

- the ground surface at the locations of the geoprobes was estimated by interpolating spot elevations shown on a drawing prepared by DDC, entitled "Queens Hospital EMS Station, Topographical Map," dated August 2, 2005;
- the top of the tunnel at the location of the geoprobes was assumed to be at the depth of refusal;
- straight lines were drawn between the ground elevations and assumed top of tunnel elevations at the geoprobe locations.

Because of the uncertainties associated with the above methodology, the profiles may not represent the actual profile of the top of the tunnel, as there may be changes in grade between the geoprobe locations.

A ground penetrating radar survey was also planned as part of the utility investigation. The survey was to be performed by Quantum Geophysics, under a subcontract with Matrix. On December 10, 2005, Quantum started the survey and were getting poor data due to the field conditions, as it had snowed and rained the previous day and there was a concrete slab, with what appeared to be steel reinforcement within, covering most of the planned survey area. Then, moisture got into the equipment causing it to malfunction, and the survey effort had to be terminated.

MATRIX ENGINEERING SERVICES, P.C.

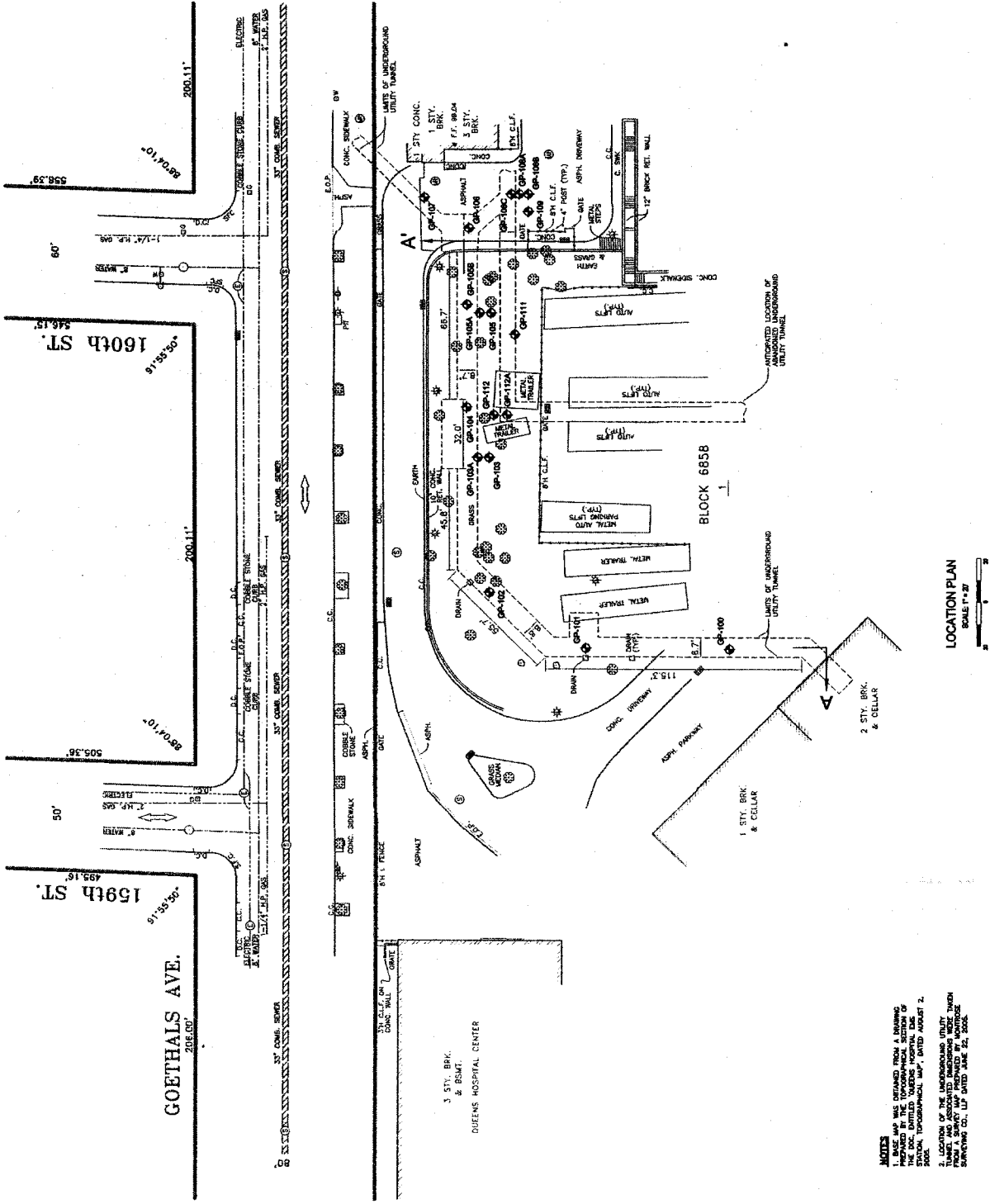
UTILITY INVESTIGATION
 NEW QUEENS HOSPITAL EMS FACILITY
 BOROUGH OF QUEENS
 December, 2005

F175 QUEENS
 SES 3653A

TABLE 1 - DEPTHS OF GEOPROBES

Boring ID	Depth Below Ground Surface, ft	Notes	Date Performed
GP 100	2.5'	Refusal	12/8/2005
GP 101	3.0'	Refusal	12/8/2005
GP 102	5.5'	Refusal	12/8/2005
GP 103	10.5'	No Refusal	12/8/2005
GP 103A	6.5'	Refusal	12/8/2005
GP 104	6.5'	Refusal	12/8/2005
GP105	9'	No Refusal	12/9/2005
GP 105A	9'	No Refusal	12/9/2005
GP 105B	6'	Refusal	12/9/2005
GP 106	8"	Refusal at 8"; much harder and could not penetrate. Driller used roller bit to penetrate through 4" of hard material, probably concrete.	12/10/2005
GP 107	6'	Refusal	12/10/2005
GP 108A	22'	No Refusal	12/10/2005
GP 108B	18'	No Refusal	12/10/2005
GP 108C	2'	Refusal	12/10/2005
GP 109	12'	Refusal (probably not tunnel)	12/10/2005
GP 111	3'	Refusal	12/9/2005
GP 112	13'	No Refusal	12/9/2005
GP 112A	2.5'	Refusal	12/9/2005

Note: GP-110 was not performed; planned location was not accessible by drilling equipment.



LEGEND
 GEOPROBE LOCATION
 SECTION A-A (SEE FIGURE 2)

NOTE: GP-110 not performed. Planned location was not accessible.

	CITY OF NEW YORK DEPARTMENT OF DESIGN & CONSTRUCTION DIVISION OF TECHNICAL SUPPORT		
	PREPARED BY: MATRIX ENGINEERING SERVICES P.C. 140 MADISON AVE. 207 EAST MANHATTAN, N.Y. 10017		
	PREPARED FOR: BUREAU OF ENVIRONMENTAL & GEOTECHNICAL SERVICES		
	UTILITY INVESTIGATION NEW QUEENS HOSPITAL EMS FACILITY BOROUGH OF QUEENS		
F175QUEENS 3653A	GEOPROBE LOCATION PLAN		DATE JANUARY 11, 2008
		SCALE	FIGURE
		AS SHOWN	1

NOTES
 1. BASE MAP WAS OBTAINED FROM A DRAWING
 AND WAS NOT FIELD VERIFIED. THE LOCATION OF
 THE DEDICATED VARIOUS HOSPITAL AND
 STATION, TOPOGRAPHICAL MAP, DATED AUGUST 72.
 2. LOCATION OF THE UNDERGROUND UTILITY
 TUNNEL AND ASSOCIATED UNDERGROUND WIRE TRENCH
 WAS NOT FIELD VERIFIED. THE LOCATION OF THE
 TUNNEL WAS OBTAINED FROM A DRAWING DATED
 JANUARY 11, 2008.

DRAFTSPERSON SCOTT HALL CHECKER JENNIFER LARSON QUARRY OUTSIDE/ERIC GRANTON GEOPROBE OVERSIGHT	JEFFREY F. MATZ, C.P.E. SECTION CHIEF B.E.C.E.	JEAN M. JEANLOUIS DIRECTOR B.E.C.E.	MARK A. CANU ASSISTANT COMMISSIONER DIVISION OF TECHNICAL SUPPORT	NO. 1 DATE DESCRIPTIONS REVISIONS	
				1. DITING ADD SECTION A-A LOCATION K.L. APPROV	



REPORT

of

GEOTECHNICAL INVESTIGATION

**Queens Hospital EMS Station
159th Street and Goethals Avenue
Queens, NY**

Prepared for: Mr. Charles Wolf
Dean/Wolf Architects
40 Hudson Street
New York, NY 10013

Prepared by: Future Tech Consultants of NY, Inc.
52 East 2nd Street
Mineola, NY 11501

FTC Job No: DWA106A
Date: October 31, 2006



October 31, 2006

Dean/Wolf Architects
40 Hudson Street,
New York, NY 10013

Attn: Mr. Charles Wolf

Re: Geotechnical Evaluation Report
Proposed pavement and retaining wall construction
Queens Hospital EMS Station
159th Street and Goethals Avenue,
Queens, NY
FTC Job No.: DWA106A

Dear Mr. Wolf:

This report presents the results of our geotechnical evaluation of the above referenced project. The work was performed in accordance with our proposal dated October 18, 2006 and your subsequent written authorization.

Our scope of service was described in the proposal and included:

- Full-time inspection of six (6) test borings;
- Performance of engineering evaluation to determine the stratigraphy and physical characteristics of the subsoils, and to develop recommendations for the design and construction of pavement and retaining wall structure;
- Preparation of a written report summarizing our findings, conclusions, and recommendations.

1 PROJECT AND SITE DESCRIPTION

The project site is located north of Queens Hospital Center at the intersection of Goethals Avenue and 159th Street, in Queens, New York. The project site is an elevated area that is partially asphalt-paved for parking. Currently several metal trailers occupy portion of the parking area. The remainder of the site is wooded or grassed.

The purpose of this field exploration was to provide recommendations for the design and installation of a new pavement for the proposed parking area and of a new retaining wall structure that would separate the south end of the proposed parking area from an elevated access drive to the north.

Currently the proposed parking area, though mostly occupied by metal trailers, is relatively level with elevations at about 113'. The proposed finished grade of the parking area is to be established at Elev. 109'.

2 FIELD EXPLORATION

A total of six (6) test borings were performed for this project, including 3 (PK1 to PK3) in the proposed pavement area and 3 (RT1 to RT3) along the proposed retaining wall line. The borings were performed by Aquifer Drilling & Testing Inc. of New Hyde Park, New York during the period from October 26 to October 27, 2006 and was observed by Future Tech Consultants (FTC) Professional Engineering staff. The boring locations are selected by Dean/Wolf Architects and are shown on drawing BL-1, which is attached at the end of this report.

All borings were drilled to a depth of 27' below grade as per project requirements. The soils encountered were sampled continuously for the first 20' or 21', and at the depth of 25' below grade. Boring method included a combination of driven-in casing and Mud Rotary method. Each soil samples was extracted using a Standard Split-Spoon sampler by performing a Standard Penetration Test (SPT) in accordance with ASTM 1586.

During the drilling operations, extracted soil samples were visually examined and classified by our professional engineer. The soil samples were then placed in sealed glass jars and were later returned to ADT shop for further review and/or testing.

Detailed description of the soils encountered in the borings was documented in the boring logs, which are presented in Appendix A.

3 SUBSURFACE CONDITIONS

The following provides a general description of the soil profiles inferred from the test borings. While the borings may indicate that the subsurface conditions appear to be relatively uniform across the site, it should be recognized that the number of borings was small compared to the size of the site, and that the existence of anomalies cannot be precluded.

3.1 Soil Profile

Four of the six borings performed encountered 10" of asphalt concrete at the surface. Below the surficial asphalt pavement, the borings encountered miscellaneous fill that extend to

depths varying from 4' to 13' below grade. The fill was found to consist chiefly of granular material of sand and gravel with trace to some amount of brick and concrete fragments and register a loose to medium dense condition. The miscellaneous fill is classified as NYC 11-65 class.

The granular fill was underlain by natural glacial deposit that extends to the maximum depth of the exploration. The glacial deposit consists predominantly of coarse-medium-fine sand with gravel, boulders and trace silt. The sands are predominantly SP Group of Unified Soil Classification System (USCS) or 7-65 class of the NYC Building Code with variation of GP group or 6-65 class at depth. The sands registered a medium dense to very dense condition, consistent with the characteristics of glacial deposits.

3.2 Groundwater

Groundwater was not encountered in the borings within the maximum depth of the exploration at 27' below existing grade. It should be expected that groundwater table would fluctuate with seasonal, tidal and climatic conditions.

4 DISCUSSION AND RECOMMENDATIONS

The borings indicate a general profile of 4'-13' of miscellaneous granular fill, followed by the glacial deposit of coarse-medium-fine sand with gravel.

Based on the soil profile established above and our understanding of the proposed construction, we recommend the following design parameters for consideration.

4.1 Pavement Recommendations

We suggest the following pavement sections for consideration assuming the proposed pavement is primarily for passenger parking with few daily trucks.

Standard Duty Pavement (to be used for passenger parking)

Bituminous concrete Surface Course = 1 1/2" N.Y.S. Type 6F
Bituminous concrete Base Course = 3" N.Y.S. Type 2
Crushed stone subbase course = 8" NYSDOT Type 2 subbase aggregate
Compacted subgrade (see recommendations below)

Heavy Duty Pavement (to be used for loading dock or heavily traffic area)

Bituminous concrete Surface Course = 2" N.Y.S. Type 6F
Bituminous concrete Base Course = 4" N.Y.S. Type 2
Crushed stone subbase course = minimum 12" NYSDOT Type 2 subbase aggregate
Compacted subgrade (see recommendations below)

It cannot be over-emphasized that the performance of the proposed pavement sections will depend on the integrity of the paving subgrade. It is imperative that the paving subgrade be subject to vigorous proofrolling and compaction with a heavy vibratory compactor (minimum drum weight of 10 tons) to an unyielding consistency and/or to a density not lower than 95% of its maximum dry density as determined in accordance with ASTM D1557. Any soft area detected during proofrolling and compaction should be excavated, removed, and backfilled with select granular fill, which shall meet the grading requirements as stipulated in NYSDOT specifications. Select granular fill should be placed in maximum 12" lifts with each lift compacted to at least 95% of its maximum dry density as determined in accordance with ASTM D1557.

4.2 Retaining Wall

Borings RT1 to RT3, which were performed along the proposed retaining wall line, encountered miscellaneous fill to a depth of 13' below existing grade. The existing fill material, in our opinion, is marginal for support of the proposed retaining wall foundations.

Based on our analysis, we suggest that the proposed retaining wall structure be supported on spread footings bearing on at least one ft. of controlled compacted fill. The footings should be established at a minimum depth of 4' below the proposed finished grade of Elev. 109. This scheme will require undercutting the footing subgrade to a minimum elev. of 104 and then backfilling it with controlled compacted fill.

Prior to backfilling, the undercut subgrade should be subject to proofrolling and compaction to an unyielding consistency. Any soft or pumping area detected during the proofrolling should be removed and replaced with controlled compacted fill. We suggest NYSDOT Type 2 subbase aggregate be used as control fill. Control fill should be compacted to at least 95% of its maximum dry density as determined in accordance with ASTM D1557.

Retaining wall footings established on controlled compacted fill may be designed using an allowable bearing capacity of 2 tsf (tons per square foot).

The retaining wall structure should be designed based on "earth pressure at active condition", if the top of the wall is to be free of restraint. The soil parameters listed in the following table may be used for the wall design.

The retaining wall design should also consider surcharge, if any, from the nearby traffic loading, and dynamic loading from seismic motion.

Backfilling against the retaining wall should utilize free-draining material, consisting of sand and gravel with less than 10% fines (minus #200 sieve size). Foundation drainage should be provided behind the wall along the length of the structure.

Soil Parameters

Strata	Depth (ft)	Soil Decryption	Unit Weight (psf)	Friction Angle (degree)	Remarks
			Moisture Unit Weight		
F	0'-13'	Fill / Medium Dense Sand	120-125	28-30	
S	13'-27'	Medium dense to Dense Sand	130	32-35	

Friction coefficient between the footing concrete and footing bearing soil = 0.4

4.3 Backfilling

Backfilling against the retaining walls should not commence until the wall concrete has gained sufficient strength and/or the wall is properly braced or shored. The backfill material should consist of relatively free-draining soil containing less than 10% fines (minus No 200-sieve size). The backfill should be placed in loose horizontal lifts with each lift not exceeding 12 inches in thickness. Each lift should be compacted to at least 95% of the maximum dry density of the fill as determined in accordance with ASTM D1557.

5 LIMITATIONS

The conclusions and recommendations contained in this report are based on the subsurface data obtained during this investigation and on the details stated in this report. Should conditions be encountered which differ specifically from those stated in this report, we should be notified immediately so that our recommendations may be reviewed and/or revised, if necessary.

6 CONSTRUCTION CONSULTATION AND INSPECTION

Due to the nature of the soils and subsurface conditions at this site and the recommendations set forth herein, consultation and inspection services by a qualified soil engineer are recommended for the following:

1. Preparation of the site including all clearing, stripping of undesirable material, and initial proofrolling and compaction of the in-situ soils.
2. Placement of all controlled backfill and/or fill, if any.



3. Preparation of pavement subgrade.
4. Installation of retaining wall subgrade.

We trust the above information will allow you to proceed with the design and construction of the proposed pavement sections and retaining wall structure.

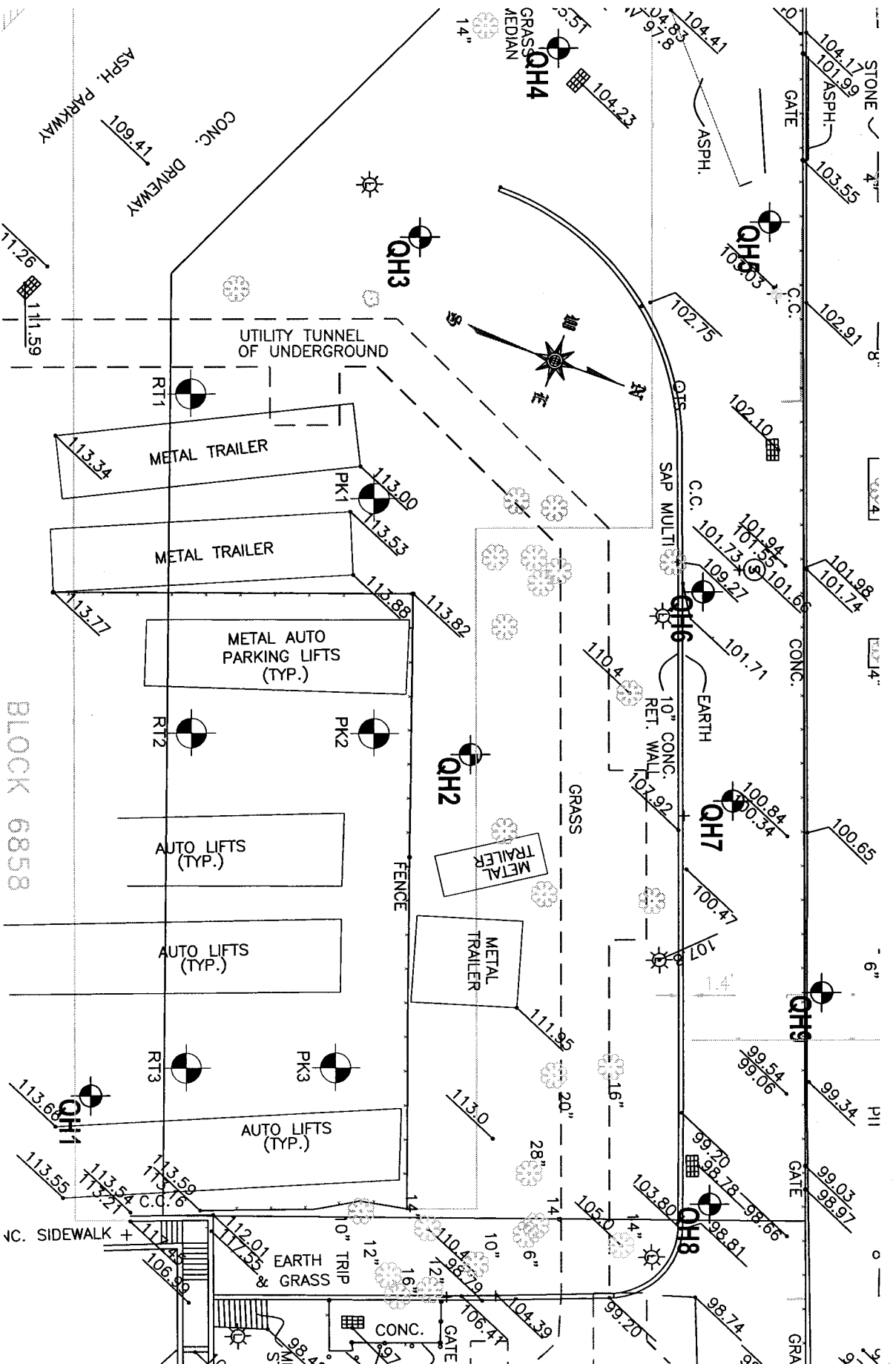
We thank you for the opportunity of providing this service to you. Should you have any questions regarding this report, or if we can be of further assistance, please do not hesitate to contact us.

Respectfully Submitted
Future Tech Consultants of New York, Inc.

Steve J. J. Lin, P.E.

Attachments:

Drawing	BL-1 Boring Location Plan
Appendix A	Record of Boring Logs with FTC Field Soil Classification System



LEGEND:

- Test borings observed by FTC in October, 2006
- Previous borings performed by Matrix Engineering Services in November, 2005

NOTE: THIS SITE PLAN WAS DEVELOPED BASED ON THE PLAN DRAWING BY DEANWOLF ARCHITECTS.



Future Tech Consultants of NY, Inc.
52 East 2nd Street
Mineola, New York 11501
Tel: 516-355-0168
Fax: 516-355-0271

CLIENT:

DeanWolf Architects

PROJECT:

Queens Hospital
EMS Station
159th St., Goethals Ave.
Queens, NY

REVISIONS

TITLE: TEST BORING LOCATION PLAN

PROJECT NO.:	DWA106A	DRAWING NO.:	BL-1
DRAWN BY:	J. Kim	DATE:	10/31/06
SCALE:	N.T.S.	SHEET:	1 OF 1



APPENDIX A

Record of Boring Logs with
FTC Field Soil Classification System



FIELD SOIL CLASSIFICATION SYSTEM

Future Tech Consultants of New York, Inc. uses the following definitions, abbreviations, and terminologies to classify and correlates soil and rock samples in the field.

UNIFIED CLASSIFICATION: The soil samples are described by major constituents, minor constituents, with modifiers, color, odors, moisture and density/consistency. USCS symbols are included in parenthesis when requested.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS):

COARSE GRAINED SOILS

GW	- Well graded gravel
GP	- Poorly graded gravel
GM	- Silty gravel
GC	- Clayey gravel
SW	- Well graded sand
SP	- Poorly graded sand
SM	- Silty sand
SC	- Clayey sand

FINE GRAINED SOILS

ML	- Silts of low plasticity
CL	- Clays of low plasticity
OL	- Organic silt/clay of low plasticity
MH	- Silts of high plasticity
CH	- Clays of high plasticity
OH	- Organic silt/clay of high plasticity
PT	- Peat and high organic soils

SOIL PARTICLE SIZE IDENTIFICATION

Boulder.....	12 inch diameter or greater
Cobbles.....	3 to 12 inch diameter
Gravel.....	Coarse--- 1 1/2 to 3 inch Medium--- 3/4 to 1 1/2 inch Fine--- 4.75 mm to 3/4 inch
Sand.....	Coarse--- 2.0 to 4.75 mm Medium--- 0.425 to 2.0 mm Fine--- 0.075 to 0.425 mm
Silt & Clay.....	Smaller than 0.075mm

MODIFIERS (Percentage)

Trace (tr).....	1-10
Some (sm).....	11-20
Adjective (ly).....	21-35
And (&)	36-50

ABBREVIATIONS

Color	Size
Bn - brown	C - coarse grained
Gy - gray	M - medium grained
Blk - black	F - fine grained
Wh - white	Misc. - Miscellaneous
Rd - red	W.O.R. - weight of rod
Lt - light	W.O.H. - weight of hammer
Dk - dark	N.R. - no recovery
Multi - multi-colored	T.B.C. - test boring completed

N.Y.C BUILDING CODE C26-1103:

CLASS OF MATERIAL DESCRIPTION

1-65	.....	Hard Sound Rock
2-65	.....	Medium Sound Rock
3-65	.....	Intermedium Sound Rock
4-65	.....	Soft Rock
5-65	.....	Hardpan
		Gravel and Gravel Soils
6-65	.....	(Soil Group GW, GP, GM & GC and Soil Group SW, SP, and SM containing more than 10% Gravel)
		Sands (Other than Fine Sands)
7-65	.....	(Soil Group GW, GP, GM & GC and Soil Group SW, SP, and SM containing not more than 10% Gravel)
8-65	.....	Fine Sand
9-65	.....	Clay and Clay Soils
		(Soil Groups SC, CL & CH)
10-65	.....	Silts and Silt Soils
		(Soil Groups ML & MH)
11-65	.....	Nominally Unsatisfactory Materials

DENSITY - Cohesionless soil (Gravel & Sand)

Density	Approximate range of (N)
Very loose.....	4 blows/ft or less
Loose.....	5 - 10 blows/ft
Medium dense.....	11 - 30 blows/ft
Dense.....	31 - 50 blows/ft
Very dense.....	51 blows/ft or higher

CONSISTENCY - Cohesive soil (clay & silt)

Consistency	Approximate range of (N)
Very soft.....	1 blows/ft or less
Soft.....	2 - 4 blows/ft
Medium stiff.....	5 - 8 blows/ft
Stiff.....	9 - 15 blows/ft
Very stiff.....	16 - 30 blows/ft
Hard.....	31 blows/ft or greater

ROCK QUALITY

R.Q.D. (%)	Rock Description
0 - 25	..... Very poor
25 - 50	..... Poor
50 - 75	..... Fair
75 - 90	..... Good
90 - 100	..... Excellent

Standard Penetration Test (SPT - ASTM D-1586) - a 2.0" O.D. (1-3/8" I.D.) split barrel sampler is driven into undisturbed soil by means of a 140 pound weight hammer free falling a vertical distance of 30 inches. The sampler is normally driven three or four successive 6-inch increments. The total number of blows required for the last or middle 12 inches of penetrations is termed as Standard Penetration Resistance (N).



FIELD TEST BORING LOG

CLIENT: Dean/Wolf Architects

DATE: 10/27/06

PROJECT: Queens Hospital EMS Station, Queens, NY

FTC No: DWA106A

DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

BORING NO.: PK1

Sheet 1 of 1

Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth	
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'	
-	-	10/27/06	-				
DEPTH	*	Sample			NYC Classification	Soil Description	Remarks
		T	No.	Depth	N		
5' 10'			S-1	0'-2'	5-5-5-5	11-65	Mf sand, tr gravel, silt & vegetation / blk, dry (Fill)
			S-2	2'-4'	4-11-13-15	11-65/7-65	Mf sand, tr gravel / bn, dry, m.dense (SP/Possible Fill)
			S-3	4'-6'	21-25-34-33	7-65	Mf sand / bn-blk, dry, v.dense (SP)
			S-4	6'-8'	10-27-35-22	7-65	Mf sand, tr gravel / bn, dry, v.dense (SP)
			S-5	8'-10'	17-19-29-33	7-65	Mf sand / bn, dry, v.dense (SP)
			S-6	10'-12'	15-18-21-24	7-65	Mf sand, tr boulder / bn, dry, dense (SP)
			S-7	12'-14'	20-19-20-30	7-65	Same / dense (SP)
			S-8	14'-16'	31-38-36-37	7-65	No Recovery
			S-9	16'-18'	12-19-14-17	7-65	Mf sand, tr gravel / bn, dry, dense (SP)
			S-10	18'-20'	26-36-38-25	7-65	Mfc sand, tr gravel / bn, dry, v.dense (SP)
25' 30'							
			S-13	25'-27'	27-32-32-35	7-65	Mf sand / bn, dry, v.dense (SP)
35' 40'							
							Test Boring Completed @27'

☐ S-2" O.D. Split Spoon Sample☒ U - Undisturbed Sample, 3" Diam.☒ - Core Drilling☐ - No Recovery

N- Standard Penetration Resistance per 6"

(140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



FIELD TEST BORING LOG

CLIENT: DEAN/WOLF Architects
 PROJECT: Queens Hospital EMS Station, Queens, NY
 DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

DATE: 10/26/06
 FTC No: DWA106A

BORING NO.: PK2 Sheet 1 of 1 Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth	
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'	
-	-	10/27/06	-				
DEPTH	*	Sample			NYC Classification	Soil Description	Remarks
		T	No.	Depth	N		
			S-1	1'-3'	5-6-4-5	11-65	10" Asphalt concrete
			S-2	3'-5'	3-4-4-3	11-65	Cmf sand, tr gravel & concrete fragments / bn, dry (Fill)
5'			S-3	5'-7'	8-8-7-9	11-65	Mf sand, tr gravel & silt / bn, dry (Fill / SP)
			S-4	7'-9'	9-10-10-9	7-65	Cmf sand, tr gravel & concrete fragments / bn-blk, dry (Fill)
			S-5	9'-11'	12-12-11-14	7-65	Mf sand, tr silt / bn, dry (SP)
10'			S-6	11'-13'	14-13-14-16	7-65	Cmf sand, tr gravel (SP)
			S-7	13'-15'	12-18-21-20	7-65	Mf sand, tr silt / bn, moist, m.dense (SP)
15'			S-8	15'-17'	18-21-22-27	7-65	Same / dense (SP)
			S-9	17'-19'	16-18-16-19	7-65	Cmf sand, tr gravel / bn, dry, dense (SP)
			S-10	19'-21'	21-20-22-22	7-65	Same / dense (SP)
20'							
25'							
			S-13	25'-27'	18-22-40-50/4"	7-65	Mf sand / bn, dry, v.dense (SP)
30'							Test Boring Completed @27'
35'							
40'							

☐ S-2"O.D. Split Spoon Sample
 ☒ U - Undisturbed Sample, 3" Diam.
 ☒ - Core Drilling
 ☐ - No Recovery
 N- Standard Penetration Resistance per 6" (140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



FIELD TEST BORING LOG

CLIENT: DEAN/WOLF Architects
 PROJECT: Queens Hospital EMS Station, Queens, NY
 DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

DATE: 10/26/06
 FTC No: DWA106A

BORING NO.: PK3 Sheet 1 of 1

Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth	
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'	
-	-	10/27/06	-				
DEPTH	*	Sample			NYC Classification	Soil Description	Remarks
		T	No.	Depth	N		
5' 10'			S-1	1'-3'	5-4-4-3	11-65	10" Asphalt concrete
			S-2	3'-5'	2-2-2-2	11-65/7-65	Cmf sand, tr concrete fragments / bn, dry (Fill)
			S-3	5'-7'	3-5-5-5	11-65/7-65	Mf sand, tr gravel / bn, moist, loose (SP, possible fill)
			S-4	7'-9'	9-7-7-9	11-65/7-65	Mf sand, tr silt & gravel / bn, moist, m.dense (SP, possible fill)
			S-5	9'-11'	7-7-7-7	11-65/7-65	Cmf sand, tr silt & gravel / bn, moist, m.dense (SP, possible fill)
			S-6	11'-13'	7-14-12-11	7-65	Same / moist, m.dense (SP, possible fill)
			S-7	13'-15'	9-9-10-9	7-65	Mf sand, tr silt & gravel / bn, moist, m.dense (SP)
			S-8	15'-17'	35-21-29-34	7-65	Mf sand, tr gravel & silt / bn, moist, m.dense (SP)
			S-9	17'-19'	22-14-18-20	7-65	Fm sand, tr gravel / bn, moist, v.dense (SP)
			S-10	19'-21'	10-12-12-15	7-65	Mf sand / bn, moist, dense (SP)
25' 30'			S-13	25'-27'	30-29-30-35	7-65	Same / m.dense (SP)
							Same / v.dense (SP)
Test Boring Completed @27'							

☐ S-2" O.D. Split Spoon Sample

☒ U - Undisturbed Sample, 3" Diam.

☒ - Core Drilling

☐ - No Recovery

N- Standard Penetration Resistance per 6" (140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



FIELD TEST BORING LOG

CLIENT: DEAN/WOLF Architects
 PROJECT: Queens Hospital EMS Station, Queens, NY
 DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

DATE: 10/27/06
 FTC No: DWA106A

BORING NO.: RT1 Sheet 1 of 1

Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'
-	-	10/27/06	-			

DEPTH	*	Sample			NYC Classification	Soil Description	Remarks
		T	No.	Depth	N		
5'			S-1	1'-3'	8-10-15-16	11-65	Mf sand, tr vegetation / blk, bn, dry, m.dense (SP / Fill)
			S-2	3'-5'	4-4-5-5	11-65/7-65	Mf sand, tr gravel / bn, moist, loose (SP)
			S-3	5'-7'	5-5-6-7	11-65/7-65	Mf sand, tr gravel / bn, moist, m.dense (SP)
			S-4	7'-9'	4-6-6-5	11-65/7-65	Mf sand / bn, moist, m.dense (SP)
10'			S-5	9'-11'	8-9-9-7	11-65/7-65	Same / m.dense (SP)
			S-6	11'-13'	10-10-8-8	11-65/7-65	Same / m.dense (SP)
15'			S-7	13'-15'	15-27-29-44	7-65	Mf sand / v.dense (SP)
			S-8	15'-17'	47-43-38-41	7-65 / 6-65	Mf sand, tr boulder fragments / bn, dry, v.dense (SP / GP)
			S-9	17'-19'	31-33-35-27	7-65	Mf sand, sm boulder fragments / bn, dry, v.dense (SP / GP)
20'			S-10	19'-21'	27-33-34-33	7-65	Mf sand / bn, dry, v.dense (SP)
25'							
			S-13	25'-27'	21-32-43-41	7-65 / 6-65	Mf sand, sm boulder fragments / bn-blk, dry, v.dense (SP / GP)
30'							Test Boring Completed @27'
35'							
40'							

☐ S-2"O.D. Split Spoon Sample

☒ U - Undisturbed Sample, 3" Diam.

☒ - Core Drilling

☐ - No Recovery

N- Standard Penetration Resistance per 6"

(140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



FIELD TEST BORING LOG

CLIENT: DEAN/WOLF Architects

DATE: 10/27/06

PROJECT: Queens Hospital EMS Station, Queens, NY

FTC No: DWA106A

DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

BORING NO.: RT2

Sheet 1 of 1

Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth		
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'		
-	-	10/27/06	-					
DEPTH	*	Sample			NYC Classification	Soil Description	Remarks	
		T	No.	Depth	N			
5'			S-1	1'-3'	25-50/1"	11-65	10" Asphalt concrete Cmf sand, tr concrete & brick fragments / blk-bn, dry (Fill)	13'
			S-2	3'-5'	8-7-5-5	11-65	Same / bn (Fill)	
			S-3	5'-7'	6-5-4-4	11-65	Mf sand, tr concrete & brick fragments / bn (Fill)	
			S-4	7'-9'	12-15-13-15	11-65	No Recovery	
10'			S-5	9'-11'	6-7-8-11	11-65	Mf sand, tr silt / bn, dry, m.dense (SP / Fill)	
			S-6	11'-13'	9-11-11-13	11-65	Mf sand, tr brick fragments / bn, dry (Fill / SP)	
15'			S-7	13'-15'	30-26-27-37	7-65	Mf sand, tr silt / bn, moist, v.dense (SP)	
			S-8	15'-17'	17-15-15-16	7-65	Same / dense (SP)	
			S-9	17'-19'	27-30-37-43	7-65	Same / v.dense (SP)	
20'			S-10	19'-21'	24-26-33-27	7-65	Same / v.dense (SP)	
25'								
			S-13	25'-27'	27-30-35-27	7-65 / 6-65	Mf sand, sm boulder fragments / bn-rd, v.dense (SP / GP)	
30'							Test Boring Completed @27'	
35'								
40'								

☐ S-2"O.D. Split Spoon Sample☒ U - Undisturbed Sample, 3" Diam.☒ - Core Drilling☐ - No Recovery

N- Standard Penetration Resistance per 6"

(140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



FIELD TEST BORING LOG

CLIENT: DEAN/WOLF Architects
 PROJECT: Queens Hospital EMS Station, Queens, NY
 DRILLER: Aquifer Drilling & Testing Inc. New Hype Park, NY

DATE: 10/26/06
 FTC No: DWA106A

BORING NO.: RT3

Sheet 1 of 1

Ground Surface Elev.: Existing Grade

Ground Water Data				* Method of Advancing Boring		Depth	
Depth	Hour	Date	Hrs. After Completion	A	Mud Rotary	0' - 27'	
-	-	10/27/06	-				
DEPTH	*	Sample			NYC Classification	Soil Description	Remarks
		T	No.	Depth	N		
5' 							

☐ S-2"O.D. Split Spoon Sample☒ U - Undisturbed Sample, 3" Diam.☒ - Core Drilling☐ - No Recovery

N- Standard Penetration Resistance per 6" (140# Hammer, 30" drop, Cathead & Rope system)

Inspected By: S. Lin, P.E.



December 20, 2006

Dean/Wolf Architects
40 Hudson Street,
New York, NY 10013

Attn: Mr. Charles Wolf

Re: Geotechnical Investigation Report
Queens Hospital EMS Station
159th Street and Goethals Avenue,
Queens, NY
FTC Job No.: DWA106

Dear Mr. Wolf:

To avoid the existing tunnel from being damaged during pile driving, it is suggested that the closest row of H piles be located at a minimum distance (clearance) of 3 ft from the outermost edge of the tunnel structure, which shall be verified in the field by means of test pits or other methods approved by the project engineer prior to pile driving.

It is further suggested that a seismograph instrument be placed inside the tunnel during pile driving to monitor the vibration experienced by the tunnel structure. The maximum Peak Particle Velocity (PPV) allowed on the tunnel structure should be limited to ½ inch per second.

We trust the above information is sufficient for your review and use.

Should you have any questions regarding this report, or if we can be of further assistance, please do not hesitate to contact us.

Respectfully Submitted
Future Tech Consultants of New York, Inc.

Steve J. J. Lin, P.E.

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February 13, 2007

Dean/Wolf Architects
40 Hudson Street
New York, NY 10013

Attn: Mr. Gerri Davis

Re: Geotechnical Consultation
Proposed Queens Hospital EMS Station
Queens, NY
FTC Job No.: EDWA106A

Dear Ms. Davis:

In accordance with your request, FTC submits the following information for your review and use.

It is our opinion that the proposed underground fuel tank and water tank need not be supported on piles provided the following recommendations are observed.

1. Both the fuel tank and the water tank should be supported on at least one (1) ft. of $\frac{3}{4}$ " crushed stone placed over the compacted fill as described below.
2. Prior to receiving crushed stone course, the tank subgrade should be subject to proofrolling using a heavy vibratory roller (with minimum drum weight of 10 tons). Any soft material or pumping areas detected during the proofrolling should be removed and replaced with controlled compacted fill. The crushed stone course should also be compacted.
3. Both the fuel tank and the water tank shall be located sufficient distance from the proposed building and shall be installed with full safe-proof measures that would ensure no leaking of the tank contents into the surrounding soils.

We trust the above information is sufficient for your review and use. If you should have any questions regarding this report, or if we can be of further assistance, please do not hesitate to call.

Sincerely,
Future Tech Consultants of New York, Inc.

Steve J. J. Lin, P.E.

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August 10, 2007

Dean/Wolf Architects
40 Hudson Street,
New York, NY 10013

Attn: Mr. Charles Wolf

Re: Site Inspection Report
Queens Hospital EMS Station
159th Street and Goethals Avenue,
Queens, NY
FTC Job No.: DWA106

Dear Mr. Wolf:

On August 9, 2007, a tunnel walkthrough was performed to review the structural integrity of the existing steam tunnel that runs beneath the proposed building, to identify areas of concern where extra precautions can be taken during the construction phase, and to propose procedures to minimize disturbance to the existing tunnel and its equipment.

Attendees include representatives from various agencies. See meeting minutes prepared by Chris Kroner of Dean/Wolf Architects for list of attendees.

OBSERVATION:

The existing steam tunnel appeared to have been constructed of reinforced concrete and generally in fair condition, except for areas as identified in the field. Cracks both vertical and horizontal were found on the tunnel wall at several locations. Vertical cracks were found mostly near the expansion joints of the wall, while horizontal cracks appeared at random locations without specific patterns (viewed from interior of the tunnel). The horizontal cracks are generally indication of the wall being over-stressed due to excessive lateral pressures from sources such as saturated soil, surcharge or hydrostatic pressure.

Evidence of water seepage was visible on the wall mostly at and/or near the cracks.

There are couple openings on the wall where concrete was found to have been spalling from the surface, exposing interior reinforcing rebars. These areas, along with the areas of visible cracks as identified earlier, are potential targets that could be adversely impacted by the pile driving.

RECOMMENDATIONS:

A. Test Piles

1. Select 3-4 pile locations closest to the existing tunnel as test piles for vibration monitoring within the existing tunnel.
2. Survey all interior cracks in the vicinity of the test piles, establishing baseline conditions.
3. Place vibration monitor station inside the tunnel to measure vibrations induced by pile driving.
4. Place test pile at select locations and tap it slowly until it reaches the bottom of the adjacent tunnel, from which point on drive the pile using select hammer.
5. Record peak particle velocity (PPV) detected in the monitoring station. Make sure PPV does not exceed 0.5 inches per second.
6. Should PPV exceed 0.5 inches per second or any visible damage on the wall is observed during the pile driving, cease the pile driving operation and report the results of vibration monitoring to engineer for review and determination.
7. If the PPVs recorded in the monitoring station during the entire test pile driving are smaller than 0.5 inches per second for all time and no damage are found on the wall that are attributable to pile driving, the use of monitoring station may be waived for the production piles, subject to approval by the engineers.
8. Augering or excavating the first 10' (or to the bottom of the tunnel) may be employed to minimize vibration to the tunnel. Bracing the interior of the tunnel at critical locations where distress was found can strengthen the tunnel to resist higher vibration without damage.
9. If none of the techniques is proved effective, the alternative would be to consider installing drill piles such as mini piles.

B. Construction Precautions

1. Prior to any construction activity including pile driving, the outline of the existing tunnel shall be marked or staked out on the ground for easy identification.
2. Heavy machinery should not be placed atop or nearby the top. Machinery should be placed beyond the influence line of the tunnel (1:1 slope) or at least 10 ft away, whichever is further.
3. The tunnel should be subject to periodic monitoring during the course of the construction.

Respectfully Submitted
Future Tech Consultants of New York, Inc.

Steve J. J. Lin, P.E.

Soil Characterization of Formaldehyde Contamination
For
Proposed Queens EMS Site at the Queens Hospital Center
82-68 164th Street
Borough of Queens, New York 11432

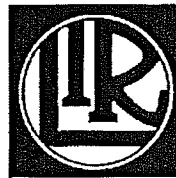
DDC ID NO. F175QUEEN
WORK ORDER LETTER NO. 12
CONTRACT REGISTRATION NO. 20070020687

Prepared for:



Bureau of Environmental and Geotechnical Services
30-30 Thomson Avenue
Long Island City, New York 11101

Prepared by:



LiRo Engineers, Inc.
15-09 132nd Street, 2nd Floor
College Point, NY 11356

FINAL

May 30, 2007



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- 2 Test Pit and Boring Location Plan

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- A Geologic Boring Logs
- B Laboratory Analytical Results



EXECUTIVE SUMMARY

A soil characterization of formaldehyde contamination was performed at a Proposed Emergency Medical Services (EMS) Facility on the northern portion of the Queens Hospital Center Campus (the site) in the Borough of Queens, New York. The site has an approximate area of 0.3 acres and is located on Goethals Avenue between 160th Street and 159th Street. LiRo Engineers, Inc. (LiRo) completed the soil characterization site work during April 2007.

This soil characterization of formaldehyde contamination was performed to evaluate handling and disposal requirements of soils that may be encountered during excavation and construction activities for the proposed new EMS Facility. Previous investigations detected formaldehyde contamination in soils located below elevation 93.5 feet ⁽¹⁾. This investigation was conducted to characterize the soils that may be encountered from the existing ground surface elevation to approximately 18 feet bgs. The investigation included field formaldehyde soil screening conducted on the test pits and a laboratory formaldehyde analysis conducted on soil samples collected from soil borings and one test pit location. The borings and test pit included grab soil sampling at depth intervals ranging from 2-18 feet bgs.

Based on the results of this and previous field investigations and analytical testing, the following conclusions are presented:

- Field screening of the borings (B-1–B-7) and test pits (TP-1–TP-4) did not reveal suspect formaldehyde contamination. PID readings were all 0.0 ppm at all the test pits and soil borings.
- Laboratory analytical results did not detect formaldehyde in any of the soil borings (B-1-B-6) or test pit (TP-3) sampled.
- Previous investigations detected formaldehyde soil contamination at depths below the 93.5 foot elevation ranging between 25 ppm and 74 ppm.

(1) Elevations refer to the Queens Highway datum which is 2.725 feet above mean sea level at Sandy Hook, New Jersey as established by the U.S. Coast and Geodetic Survey. Refer to architectural drawings prepared by Dean-Wolf Architects for grade level and building elevations



- Based on known site conditions, the formaldehyde in soil likely arose from discharge of used formaldehyde solution (formalin) at the former morgue on the adjoining property. Laboratory use of formaldehyde (used primarily for tissues preservation) is comprised by approximately 3.7% formaldehyde in a solution commonly known as 10% buffered formalin. Used 10% buffered formalin is a non-hazardous waste which was likely discharged by flushing into the sanitary sewer systems. The occurrence and distribution of formaldehyde at the site indicate that it was likely transported to the site via water (possible from a leaking sewer line).

Based on the results of this and previous field investigations and analytical testing, LiRo recommends:

- Excavated soils encountered between the ground surface (elevation varies between approximately 113.0' and 99.0' across the site) to an elevation of approximately 93.5 feet are not anticipated to be contaminated with formaldehyde impacted soils. However, field screening measures for formaldehyde should be conducted for all excavated soils.
- Portions of soils that will be encountered below the 93.5 foot elevation should be assumed to be non-hazardous formaldehyde impacted. In general non-hazardous formaldehyde impacted soils are anticipated to be encountered during deeper excavation work including, but not limited to, excavations for storm water retention tank, foundations at basement area and pile caps for elevator pit, and excavation for motor fuel tank.
- The Construction Project Specifications for the new facility should include requirements for the proper handling, transporting, and disposal of non-hazardous formaldehyde-impacted soils. The Contractor should be required to submit a Material Handling Plan, to identify the specific protocol and procedures that will be utilized to manage the soil in accordance with applicable regulations.
- A health and safety plan (HASP) should be developed for site construction workers to ensure that workers are informed of potential chemical hazards at the site and to take steps to minimize worker exposure to formaldehyde contamination in soil and soil vapor. The HASP should include an air monitoring program designed to identify worker exposure to formaldehyde vapors. The air

(1) Elevations refer to the Queens Highway datum which is 2.725 feet above mean sea level at Sandy Hook, New Jersey as established by the U.S. Coast and Geodetic Survey. Refer to architectural drawings prepared by Dean-Wolf Architects for grade level and building elevations



monitoring program should include real-time monitoring methods (i.e. use of formaldehyde analyzer or detection badges) for worker exposure monitoring.

(1) Elevations refer to the Queens Highway datum which is 2.725 feet above mean sea level at Sandy Hook, New Jersey as established by the U.S. Coast and Geodetic Survey. Refer to architectural drawings prepared by Dean-Wolf Architects for grade level and building elevations



1.0 INTRODUCTION

At the request of the City of New York Department of Design and Construction (DDC), LiRo Engineers, Inc. (LiRo) performed a soil characterization of formaldehyde contamination for a proposed Emergency Medical Services (EMS) Facility on the northern portion of the Queens Hospital Center Campus (the site) in the Borough of Queens, New York. The site has an approximate area of 0.3 acres and is located on Goethals Avenue between 160th Street and 159th Street. LiRo has prepared this report, which presents the results of the formaldehyde field investigation and laboratory analysis of collected soil samples at the site.

1.1 Purpose

The purpose of this report is to characterize formaldehyde contamination in site soils to evaluate handling and disposal requirements during construction of a new EMS building. The site location is included as Figure 1. A test pit and soil boring location plan is presented as Figure 2. LiRo has prepared this soil characterization report for the sole use of the client unless written approval is granted by the client and LiRo.

At the request of DDC, the following activities were performed as part of the soil characterization and are discussed in this report:

- At the request of DDC's architect, four (4) test pits (TP-1-TP-4) were advanced using a backhoe to survey the location a utility tunnel located beneath the site to identify potential conflicts with the new facility proposed foundation;
- Seven (7) soil borings (B-1 through B-7) were advanced across as shown on Figure 2 using direct-push, *Geoprobe*, drilling equipment equipped with a Macro Core sampler to allow the collection of soil grab samples. The samples were collected to characterize formaldehyde contamination in the proposed excavation zones;
- Field screening, consisting of visual and olfactory indicators, Photo-Ionization Detector (PID) readings for detection of formaldehyde to aid in selection of soil samples for laboratory analysis based on contaminant indicators;



- Soil sample formaldehyde analysis;
- Data review and evaluation; and
- Report preparation.

In addition, the report presents background information including the current and former site activities and summarizes previous site activities and investigations completed by LiRo.

1.2 Site Background

The site has an area of approximately 0.3 acres. The parking lot is approximately 7,500 square feet (sf) and includes steel constructed two-story hydraulic car lifts for parking. Currently, the subject site provides site access and parking for the hospital. A utility tunnel is located beneath the site. The site includes landscaped, asphalt and concrete paved areas. There is an elevated hill on the eastern side of the site. The site is located in a primarily residential area of the Borough of Queens, New York. The surrounding area is an urban setting with vegetation limited to landscaped areas. Land in the immediate vicinity of the site includes another hospital, otherwise is primarily residential with limited commercial use.

Historical use information from 1934 showed the subject site was developed with access roads and a portion of a building for the Queensboro Hospital for Communicable Diseases. This hospital appears on the Sanborn Maps until at least 1995. Although no records of USTs were identified, the hospital likely utilized fuel oil in storage tanks. The former building foundations for the hospital that was on the site may be present below site soil. Utility tunnels that connect different buildings of the Queens General Hospital site are located below the subject area.

1.3 Previous Investigations of Site

During the investigation previous reports for the site reviewed included the following:



- Phase I Environmental Site Assessment Report - Proposed Queens EMS Site at Queens Hospital Center - 82-68 164th Street - LiRo Engineers, Inc. (LiRo) September 23, 2005.
- Limited Phase II Environmental Site Investigation Report - Proposed Queens EMS Site at Queens Hospital Center - 82-68 164th Street - LiRo Engineers, Inc. (LiRo) November 14, 2005.
- Predesign Environmental Investigation Report - Proposed Queens EMS Site at Queens Hospital Center - 82-68 164th Street - LiRo Engineers, Inc. (LiRo) March 3, 2006.

1.3.1 Phase I ESA Report – Proposed Queens EMS (LiRo 2005)

A Phase I Environmental Site Assessment (ESA) was performed by LiRo dated September 23, 2005 in accordance with the American Society for Testing Materials (ASTM) practice E-1527 *Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process*. Based on the results of the Phase I ESA, LiRo made the following conclusions:

- The former hospital building located on site may have utilized fuel oil.
- Lead and/or asbestos containing material (ACM) may be present in the utility tunnel located beneath the site.
- The adjoining sites have operated as hospitals since at least the 1930s. The hospitals used fuel oil, gasoline and diesel fuel in USTs and chemicals including other VOCs at the on site morgue. Previous spill reports and subsurface investigation for the adjoining hospital site has confirmed the release of petroleum products and other VOCs including formaldehyde to soil and groundwater. Recent investigations identified formaldehyde in soil vapor collected from areas south of Building H. Formaldehyde was not identified in groundwater and was not tested for in soil. Petroleum contaminated soil in the vicinity of the UST area to a depth of at least 77 feet bgs was also recently identified. Groundwater near the former UST area contains elevated concentrations of petroleum based compounds at levels above NYS ground water quality standards. Groundwater depth ranges from 30-60 feet bgs on the adjoining site.

Based on the findings, a Phase II Environmental Site Assessment, including soil and groundwater sampling and analysis should be completed and should include asbestos and lead based materials pre-demolition or renovation surveys.



1.3.2 Phase II ESI Report – Proposed Queens EMS (LiRo 2005)

A Limited Phase II Environmental Site Investigation was performed by LiRo dated November 14, 2005. The results of the ESI showed formaldehyde detected in soil below the 93.5 foot elevation in two of the soil samples at 49 ppm and at 25 ppm. The formaldehyde results were reported to the NYSDEC Spill Hotline on 11/7/05 by Mr. James Romeo of DDC. The formaldehyde is likely the result of historical use of the site as a hospital complex that included an on-site morgue. The results also showed chloroform and 2-Butanone detected above groundwater standards.

1.3.3 Predesign Environmental Investigation Report – Proposed Queens EMS (LiRo 2006)

As a result of the detection of formaldehyde in site soil samples, DDC requested that LiRo perform a Predesign environmental investigation to further evaluate the extent of the formaldehyde impacted soils and the environmental and Health and Safety concerns associated with the site soils. The results of the predesign environmental investigation showed that formaldehyde was detected in soils below the proposed Queens EMS site. The maximum detected formaldehyde concentration was 74 ppm. Formaldehyde was also detected in soil vapor sampling.

A preliminary health risk evaluation suggests that the formaldehyde in site soil and soil vapor do not pose an elevated level of risk to current site workers or the surrounding public. Future site workers may potentially be exposed to formaldehyde-contaminated soil via direct contact (construction workers) and vapor inhalation (construction workers and future workers at the proposed EMS facility).

Comparison of formaldehyde levels in soil vapor with workplace exposure limits and ambient levels of formaldehyde indicate that soil vapor concentrations are lower than the exposure limits and only slightly higher than ambient levels of formaldehyde in air. Therefore, vapor intrusion into the proposed facility should not raise indoor air formaldehyde concentrations to levels that approach workplace exposure limits.

Research into laboratory use of formaldehyde showed that the working solution (used primarily for tissue preservation) is comprised by approximately 3.7% formaldehyde in a solution commonly known as 10% buffered formalin. Used 10% buffered formalin is a non-hazardous waste which was likely discharged by flushing into sanitary sewer systems. The occurrence and distribution of formaldehyde at the site indicate that it was likely transported to the site via water (possibly from a leaking sewer line).



Based on known site conditions, the formaldehyde in soil likely arose from discharge of used formaldehyde solution (formalin) at the former morgue on the adjoining property. Used formalin is not a listed hazardous waste.

1.4 Scope of Work

Utility clearing and the advancement of test pits and soil borings were completed by Environmental Closure and Aquifer Drilling and Testing (ADT), respectively. Field investigation activities were performed by Mark Chin of LiRo. The investigation consisted of:

- At the request of DDC's architect, four (4) test pits (TP-1-TP-4) were advanced using a backhoe to survey the location a utility tunnel located beneath the site to identify potential conflicts with the new facility proposed foundation;
- Seven (7) soil borings (B-1 through B-7) were advanced across the Site using direct-push, *Geoprobe*, drilling equipment equipped with a Macro Core sampler to allow the collection of soil grab samples. The samples were collected to characterize formaldehyde contamination in the proposed excavation zones;
- Field screening, consisting of visual indicators and PID formaldehyde readings and selection of soil samples for laboratory analysis based on contaminant indicators;
- The collection of the following samples: a boring grab, i.e. a sample from a specific soil interval such as 2-4 feet below ground surface (bgs);
- Laboratory analysis of grab samples for formaldehyde;
- Data analysis and review; and,
- The presentation of a written report.



2.0 FIELD INVESTIGATION

LiRo performed the environmental field screening and sample collection April 2, 2007 and April 5, 2007. LiRo personnel were present for field screening and sampling activities at four (4) test pits (TP-1-TP-4) and seven (7) soil borings (B-1-B-7). The test pits were advanced by Environmental Closure using a backhoe to survey the location of a utility tunnel located beneath the site. The soil borings (B-1 through B-7) were advanced by ADT across the Site using direct-push, *Geoprobe*, drilling equipment equipped with a Macro Core sampler to allow the collection of soil grab samples.

The sample containers were preserved at 4 degrees Celsius in a cooler with ice prior to and during shipment. Chain-of-Custody documentation accompanied the samples during shipment. The samples were sent to a NYS DOH certified laboratory for the analysis. EMSL, a NYS Department of Health (DOH) approved laboratory [ELAP No. 102581], subcontracted the analysis of the samples to Lionville Laboratory, Inc. The laboratory reports are included as Appendix B. This section presents a summary of the field program. The results of the sample analysis are presented in Section 3. At the request of the DDC, field derived Quality Assurance/Quality Control samples (i.e. field blank, trip blank, split-sample) were neither collected nor analyzed for this project.

2.1 Soil Sampling

Prior to drilling, ADT and Environmental Closure contacted dig safe mark out and obtained the necessary permits. The four (4) test pits (TP-1-TP-4) were advanced by Environmental Closure using a backhoe to survey a utility tunnel located beneath the site. The seven (7) soil borings (B-1 through B-7) were advanced by ADT across the Site using direct-push, *Geoprobe*, drilling equipment equipped with a Macro Core sampler to allow the collection of soil grab samples. A summary of the field investigation, including the details of the test pits and soil borings, is provided in Table 1 at the end of this report.

Upon sampler retrieval the soils were examined for visual evidence (staining, discoloration) and olfactory indications (odors) of contamination. A Photo-Ionization Detector (PID) equipped with a 11.8 eV lamp was used to qualitatively screen the soil for VOCs including formaldehyde and certain SVOCs that have ionization potentials within the range of the 11.8 eV lamp. The PID screening procedure consisted of collecting soil in a plastic zip-locked bag, allowing the soil to reach ambient outdoor temperature, and then inserting the PID probe into open space within the bag to observe a head space



reading. The completed screening readings from the PID, as well as descriptions of staining and/or odors detected can be found in Table 1 and on the Geologic Boring/Test Pit Logs in Appendix A.

Soils to be analyzed for formaldehyde were collected from areas of visible contamination, PID readings or from the depth chosen by the on-site geologist. Soil classification information and PID readings were documented on the boring/test pit logs included in Appendix A. The soil samples selected for laboratory analysis were transferred from the zip-lock bags into laboratory prepared sample jars and properly labeled. All soil boring equipment was rinsed in tap water, then scrubbed with an Alconox / tap water mixture and finally rinsed with tap water again between each sample interval. The borings were back-filled with drill cuttings and sealed with cement grout upon completion. The test pits were backfilled with the excavated soil.



3.0 INVESTIGATIVE RESULTS

A discussion of the analytical results of the soil samples is included in the following sections.

3.1 Soil Description

Soil samples were screened and described in the field by a LiRo geologist. The soils encountered were typically red/brown silty sand with some to little medium to fine gravel. Bedrock was not encountered. Field screening for evidence of olfactory signs, staining and/or discoloration and PID readings did not reveal formaldehyde contamination in the soil. A summary of the field investigation, including the screening results, completed depth, and the location of the samples submitted for laboratory analysis is provided in Table 1 at the end of this report. Boring/Test Pit logs are attached in Appendix A and the locations of the borings and test pits are included in Figure 2.

3.2 Laboratory Results for Soil Samples

Grab soil samples were analyzed for formaldehyde by EPA Method 8315 A. To define the vertical extent of suspect formaldehyde contamination, several depth intervals were chosen by the on-site geologist. One depth interval chosen by the on-site geologist from B-1, B-3, B-4 and B-5 was sampled for formaldehyde analysis. Two depth intervals chosen by the on-site geologist from B-2 and B-6 were sampled for formaldehyde analysis. A soil sample from B-7 was not collected because it was near test pit TP-3 where a sample was collected.

Table 2 summarizes the results of the soil sample formaldehyde analysis and Figure 2 depicts the soil boring and test pit locations.

3.2.1 Formaldehyde in Soil

Formaldehyde was not detected in the soil screening or in any of the soil samples. The formaldehyde lab results are summarized in Table 2.



4.0 CONCLUSIONS

A soil characterization of formaldehyde contamination was performed at a Proposed Emergency Medical Services (EMS) Facility on the northern portion of the Queens Hospital Center Campus (the site) in the Borough of Queens, New York. The subject area is located on Goethals Avenue between 160th Street and 159th Street. LiRo Engineers, Inc. (LiRo) completed the site work during April 2007. This soil characterization of formaldehyde contamination was performed to evaluate handling and disposal requirements of excavated soils encountered during construction of a proposed new EMS building. The investigation included formaldehyde soil screening conducted on test pits and a formaldehyde analysis conducted on soil samples from soil borings and one test pit located at the site. The borings and test pit included grab soil sampling at depth intervals ranging from 2-18 feet bgs.

Based on the results of this and previous field investigations and analytical testing, the following conclusions are presented:

- Field screening of the borings (B-1-B-7) and test pits (TP-1-TP-4) did not reveal suspect formaldehyde contamination. PID readings were all 0.0 ppm at all the test pits and soil borings.
- Laboratory analytical results did not detect formaldehyde in any of the soil borings (B-1-B-6) or test pit (TP-3) sampled.
- Previous investigations detected formaldehyde soil contamination at depths below the 93.5 foot elevation ranging between 25 ppm and 74 ppm.
- Based on known site conditions, the formaldehyde in soil likely arose from discharge of used formaldehyde solution (formalin) at the former morgue on the adjoining property. Laboratory use of formaldehyde (used primarily for tissues preservation) is comprised by approximately 3.7% formaldehyde in a solution commonly known as 10% buffered formalin. Used 10% buffered formalin is a non-hazardous waste which was likely discharged by flushing into the sanitary sewer systems. The occurrence and distribution of formaldehyde at the site indicate that it was likely transported to the site via water (possible from a leaking sewer line).



Based on the results of this and previous field investigations and analytical testing, LiRo recommends:

- Excavated soils encountered between the ground surface (elevation varies between approximately 113.0' and 99.0' across the site) to an elevation of approximately 93.5 foot are not anticipated to be contaminated with formaldehyde impacted soils. However, field screening measures for formaldehyde should be conducted for all excavated soils.
- Portions of soils that will be encountered below the 93.5 foot elevation should be assumed to be non-hazardous formaldehyde impacted. In general non-hazardous formaldehyde impacted soils are anticipated to be encountered during deeper excavation work including but not limited to excavations for storm water retention tank, foundations at basement area and pile caps for elevator pit, and excavation motor fuel tank.
- The Construction Project Specifications for the new facility should include requirements for the proper handling, transporting, and disposal of non-hazardous formaldehyde-impacted soils. The Contractor should be required to submit a Material Handling Plan, to identify the specific protocol and procedures that will be utilized to manage the soil in accordance with applicable regulations.
- A health and safety plan (HASP) should be developed for site construction workers to ensure that workers are informed of potential chemical hazards at the site and to take steps to minimize worker exposure to formaldehyde contamination in soil and soil vapor. The HASP should include an air monitoring program designed to identify worker exposure to formaldehyde vapors. The air monitoring program should include real-time monitoring methods (i.e. use of formaldehyde analyzer or detection badges) for worker exposure monitoring.



5.0 STATEMENT OF LIMITATIONS

The data presented and the opinions expressed in this report are qualified as stated in the attachment to this section of the report.

A handwritten signature in black ink, appearing to read 'Robert Kreuzer', is written over a horizontal line.

Robert Kreuzer

Project Manager



STATEMENT OF LIMITATIONS

The data presented and the opinions expressed in this report are qualified as follows:

1. The sole purpose of the investigation and of this report is to assess the physical characteristics of the Site with respect to the presence or absence in the environment of oil or hazardous materials and substances as defined in the applicable state and federal environmental laws and regulations and to gather information regarding current and past environmental conditions at the Site.
2. LiRo Engineers, Inc. (LiRo) derived the data in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals with information about the Site, and a limited number of subsurface explorations made on the dates indicated. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the Site, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report.
3. In preparing this report, LiRo has relied upon and presumed accurate certain information (or the absence thereof) about the Site and adjacent properties provided by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, LiRo has not attempted to verify the accuracy or completeness of any such information.
4. The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Services, including the extent of subsurface exploration and other tests. The Scope of Services, was defined by the requests of the Client, the time and budgetary constraints imposed by the Client, and the availability of access to the Site.
5. Because of the limitations stated above, the findings, observations, and conclusions expressed by LiRo in this report are not, and should not be considered, an opinion concerning the compliance of any past or present owner or operator of the site with any federal, state or local law or regulation. No warranty or guarantee, whether express or implied, is made with respect to the data reported or findings, observations, and conclusions expressed in this report. Further, such data, findings, observations, and conclusions are based solely upon site conditions in existence at the time of investigation.
6. This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the Agreement and the provisions thereof.

TABLES

TABLE 1
SUMMARY OF
FIELD INVESTIGATION

QUEENS EMS AT QUEENS HOSPITAL CENTER -
SOIL CHARACTERIZATION OF FORMALDEHYDE CONTAMINATION
82-68 164TH STREET, QUEENS, NY
DDC CAPIS ID:F175QUEEN WOL #12

Boring/ Test Pit ID	Surface Elevation (*) (ft)	Depth of Completion (feet bgs)	Depth of Groundwater (feet bgs)	Grab Interval Sampled (feet bgs)	Formaldehyde Screening Result (ppm)
TP-1	111.0	2	NE	NA	0
TP-2	110.0	5	NE	NA	0
TP-3	111.5	6	NE	NA	0
TP-4	111.1	7	NE	NA	0
B-1	110.8	16	NE	6-8	0
B-2	100.5	20	NE	16-18 and 6-8	0
B-3	104.3	8	NE	2-4	0
B-4	104.2	8	NE	2-4	0
B-5	113.5	12	NE	6-8	0
B-6	112.7	12	NE	2-4 and 6-8	0
B-7	108.5	20	NE	NS	0

* Elevation provided are approximate. Actual surveyed elevations of borings and test pits were not conducted.

Elevations refer to the Queens Highway datum which is 2.725 feet above mean sea level at Sandy Hook, New Jersey as established by the US Coast and Geodetic Survey. Refer to architectural drawings prepared by Dean-Wolf Architects for survey information.

NA = Not Applicable
NS = Not Sampled
NE = Not Encountered

TABLE 2
SUMMARY OF
FORMALDEHYDE IN SOIL

QUEENS EMS AT QUEENS HOSPITAL CENTER -
SOIL CHARACTERIZATION OF FORMALDEHYDE CONTAMINATION
82-68 164th STREET, QUEENS, NY
DDC CAPIS ID: F175QUEEN WOL:

LiRo Site ID:	Queens EMS B-1	Queens EMS B-2	Queens EMS B-2	Queens EMS B-3	Queens EMS B-4	Queens EMS B-5	Queens EMS B-6	Queens EMS B-8	Queens EMS TP-3
LiRo Sample ID:	4/5/07 6-8	4/5/07 16-18	4/5/07 6-8	4/5/07 2-4	4/5/07 2-4	4/5/07 6-8	4/5/07 2-4	4/5/07 6-8	4/2/07 NA
Date Sampled:	104.8-102.8	94.5-92.5	84.5-82.5	102.3-100.3	102.2-100.2	107.5-105.5	110.7-108.7	106.7-104.7	NA
Sample Depth (ftbgs):									
Sample Elevation (ft) *									
ANALYTE (ug/kg)									
Formaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND

* Elevation provided are approximate. Actual surveyed elevations of borings and test pits were not conducted.

Elevations refer to the Queens Highway datum which is 2.725 feet above mean sea level at Sandy Hook, New Jersey as established by the US Coast and Geodetic Survey. Refer to architectural drawings prepared by Dean-Wolf Architects for survey information.

B = Compound found in method blank J = Compound detected below reportable detection limit ftbgs = Feet below ground surface ug/kg = microgram/kilogram
ND = Not detected above laboratory MDL NE = Not established NA = Not applicable

FIGURES



10716205 DDCQueens EMSUSGS.ai



NEW YORK CITY DEPARTMENT OF
 DESIGN + CONSTRUCTION

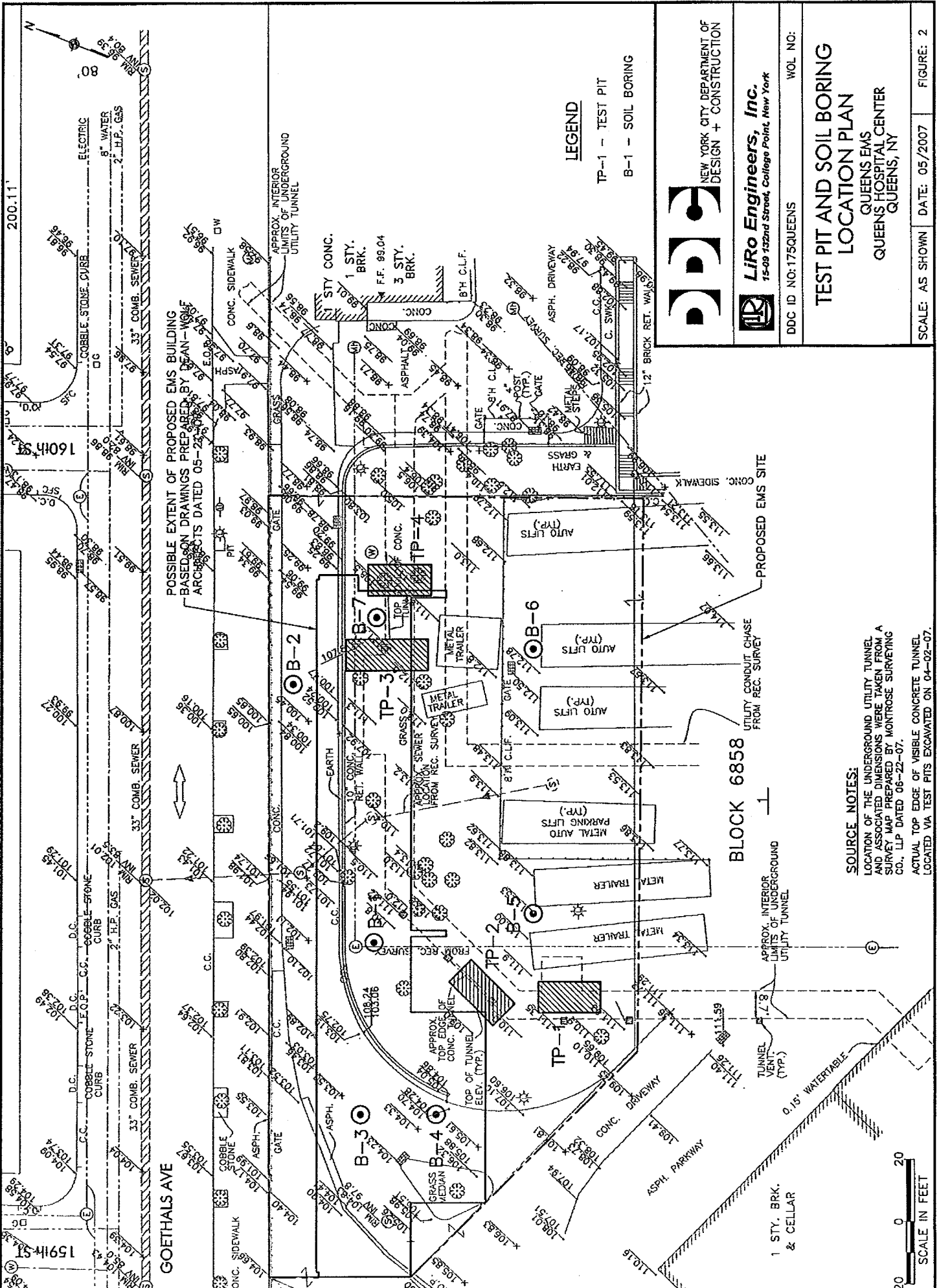


LiRo Engineers, Inc.
 15-09 132nd Street, College Point, New York

DDC ID NO: F175QUEENS

WOL NO:

USGS TOPOGRAPHICAL MAP
QUEENS EMS
AT QUEENS HOSPITAL CENTER
QUEENS, NY



APPENDIX A
GEOLOGIC BORING LOGS



TEST PIT LOGS

Project: Queens EMS

Project #: 04-84-205 #130

Client: NYC DDC

Contractor: Environmental Closure

Date Started: 4/2/07

Elevation:

Date Completed: 4/2/07

Pit max. depth: 2'

Geologist: Mark Chin

Operator: Brian Karshick

Pit Number: TP-01

Approx. water table depth: No Water Observed

DESCRIPTION

DEPTH	Section A	Section B	Section C
-0-	0-2' Red Brown Silty Sand Little M-F Gravel 100%		
-			
-2-			
-			
-4-	End Of Pit at 2'		
-			
-6-			
-			
-8-			
-			
-10-			
-			
-12-			
-			
-14-			
-			
-16-			

General: 3' W & 10' L Pit Size

Observed Wastes: Edge of Tunnel at 44"

Analytical Samples:

Comments:

PID- Background Reading

Methane- Background Reading

LEL- Background Reading



TEST PIT LOGS

Project: Queens EMS

Project #: 06-36-9047

Client: NYC DDC

Contractor: Environmental Closure

Date Started: 4/2/07

Elevation:

Date Completed: 4/2/07

Pit max. depth: 5'

Geologist: Mark Chin

Operator: Brian Karshick

Pit Number: TP-02

Approx. water table depth: No Water Observed

DESCRIPTION

DEPTH	Section A	Section B	Section C
-0-	0-5' Red Brown Silty Sand Little M-F Gravel 100%		
-			
-2-			
-			
-4-	End Of Pit at 5'		
-			
-6-			
-			
-8-			
-			
-10-			
-			
-12-			
-			
-14-			
-			
-16-			

General: 3' W & 10' L Pit Size

Observed Wastes: Edge of Tunnel at 52"

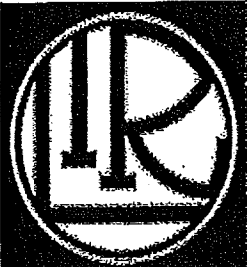
Analytical Samples:

Comments:

PID- Background Reading

Methane- Background Reading

LEL- Background Reading



TEST PIT LOGS

Project: Queens EMS

Project #: 04-84-205 #130

Client: NYC DDC

Contractor: Environmental Closure

Date Started: 4/2/07

Elevation:

Date Completed: 4/2/07

Pit max. depth: 6'

Geologist: Mark Chin

Operator: Brian Karshick

Pit Number: TP-03

Approx. water table depth: No Water Observed

DESCRIPTION

DEPTH	Section A	Section B	Section C
-0-	0-6' Red Brown Silty Sand Little M-F Gravel 100%		
-			
-2-			
-			
-4-			
-	End Of Pit at 6'		
-6-			
-			
-8-			
-			
-10-			
-			
-12-			
-			
-14-			
-			
-16-			

General: 3' W & 10'L Pit Size

Observed Wastes: Edge of Tunnel at 72"

Analytical Samples:

Comments:

PID-- Background Reading

Methane- Background Reading

LEL- Background Reading



TEST PIT LOGS

Project: Queens EMS

Project #: 04-84-205 #130

Client: NYC DDC

Contractor: Environmental Closure

Date Started: 4/2/07

Elevation:

Date Completed: 4/2/07

Pit max. depth: 7'

Geologist: Mark Chin

Operator: Brian Karshick

Pit Number: TP-04

Approx. water table depth: No Water Observed

DESCRIPTION

DEPTH	Section A	Section B	Section C
-0-	0-7' Red Brown Silty Sand Little M-F Gravel 100%		
-			
-2-			
-			
-4-			
-	End Of Pit at 7'		
-6-			
-			
-8-			
-			
-10-			
-			
-12-			
-			
-14-			
-			
-16-			

General: 3' W & 10'L Pit Size

Observed Wastes: Edge of Tunnel at 84"
Dead Pipe at 12"

Analytical Samples:

Comments:

PID- Background Reading

Methane- Background Reading

LEL- Background Reading

LiRo Engineers, Inc.										BORING NO. <u>SB-01</u>	
PROJECT <u>Queens EMS</u>										SHEET: <u>1 of 1</u>	
CLIENT <u>NYC DDC</u>										JOB NO: <u>07-16-205 #12</u>	
BORING CONTRACTOR <u>ADT</u>										BORING LOCATION:	
GROUNDWATER <u>None Observed</u>										GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE	DATE STARTED: <u>4/5/07</u>		
				DIA.		<u>Geo probe</u>			DATE FINISHED: <u>4/5/07</u>		
				WT.					DRILLER: <u>Victor</u>		
				FALL					GEOLOGIST: <u>Mark Chin</u>		
* POCKET PENETROMETER READING										REVIEWED BY:	

DEPTH	STRATA	SAMPLE				RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS PID moisture
		NO.	TYPE	BLOWS PER 6"							
						100%	Red Brown		Silty Sand little m-f Gravel		OPID
5						90%	Red Brown		Silty Sand Same m-f Gravel		OPID
10						100%	Red Brown		Silty Sand little m-f Gravel		OPID
15						100%	Red Brown		Silty Sand little m-f Gravel		OPID
20									End of Boring 16'		
									Sampled collected at 6'-8'		
25											
30											
35											

COMMENTS: <u>Sampled analyzed for Formaldehyde 8315A</u>	
PROJECT NO.: <u>Queens EMS</u>	BORING NO.: <u>SB-01</u>

LiRo Engineers, Inc.

BORING NO. SB-02

PROJECT Queens EMS

SHEET: 1 of 1

CLIENT NYC DDC

JOB NO: 07-16-205 #12

BORING CONTRACTOR ADT

BORING LOCATION:

GROUNDWATER Near Observed

GROUND ELEVATION:

DATE TIME LEVEL TYPE TYPE

DATE STARTED: 4/5/07

DIA.

DATE FINISHED: 4/5/07

WT.

DRILLER: Victor

FALL

GEOLOGIST: Mark Chin

* POCKET PENETROMETER READING

REVIEWED BY:

DEPTH	STRATA	SAMPLE				DESCRIPTION				REMARKS	
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID	moisture
					100	Red Brown		Silty Sand little m-f gravel		0 PID	
5					90	Red Brown		Silty Sand little m-f gravel		0 PID	
10					100	Red Brown		Silty Sand		0 PID	
15					100	Red Brown		Silty Sand		0 PID	
20					100	Red Brown		Silty Sand		0 PID	
25								End of Boring at 20'			
30								Sampled taken at 6'-8'			
35								+ 16'-18'			

COMMENTS: Sampled analyzed for Formaldehyde 8315A

PROJECT NO.: Queens EMS

BORING NO.: SB-02

LiRo Engineers, Inc.										BORING NO. <u>SB-03</u>	
PROJECT <u>Queens EMS</u>										SHEET: <u>1 of 1</u>	
CLIENT <u>NY C DDC</u>										JOB NO: <u>07-16-205 #12</u>	
BORING CONTRACTOR <u>ADT</u>										BORING LOCATION:	
GROUNDWATER <u>None Observed</u>										GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE	CAS	SAMPLER	CORE	TUBE	DATE STARTED: <u>4/5/07</u>		
				DIA.		<u>Geo probe</u>			DATE FINISHED: <u>4/5/07</u>		
				WT.					DRILLER: <u>Victor</u>		
				FALL					GEOLOGIST: <u>Mark Chin</u>		
* POCKET PENETROMETER READING										REVIEWED BY:	

DEPTH	STRATA	SAMPLE				RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION	CLASS USCS	REMARKS PID moisture
		NO.	TYPE	BLOWS PER 6"							
						100	Red Brown		Silty Sand little m- & Gravel		OPID
5						100	Red Brown		Silty Sand little m- & Gravel		OPID
10									End of Boring at 8'		
15									Sampled collected at 2'-4		
20											
25											
30											
35											

COMMENTS: Sampled analyzed for Formaldehyde 8315A

PROJECT NO.: Queens EMS
BORING NO.: SB-03

LiRo Engineers, Inc.										BORING NO. SB-04	
PROJECT Queens EMS										SHEET: 1 of 1	
CLIENT NY C DDC										JOB NO: 07-16-205 #12	
BORING CONTRACTOR ADT										BORING LOCATION:	
GROUNDWATER None Observed										GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE		TYPE	CAS.	SAMPLER	CORE	TUBE	DATE STARTED: 4/5/07	
					DIA.		Geoprobe			DATE FINISHED: 4/5/07	
					WT.					DRILLER: Victor	
					FALL					GEOLOGIST: Mark Chin	
* POCKET PENETROMETER READING										REVIEWED BY:	

DEPTH	STRATA	SAMPLE				DESCRIPTION				CLASS USCS	REMARKS PID moisture
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION			
					90%	Red Brown		Silty Sand little m-f Gravel		0 PID	
5					90%	Red Brown		Silty Sand little m-f Gravel		0 PID	
10								End of Boring at 8'			
15								Sampled collected at 2'-4'			
20											
25											
30											
35											

COMMENTS: **Sampled analyzed for Formaldehyde 8315A**

PROJECT NO.: Queens EMS	BORING NO.: SB-04
--------------------------------	--------------------------

LiRo Engineers, Inc.										BORING NO. <u>SB-05</u>	
PROJECT <u>Queens EMS</u>										SHEET: <u>1 of 1</u>	
CLIENT <u>NY C DDC</u>										JOB NO: <u>07-16-205 #12</u>	
BORING CONTRACTOR <u>ADT</u>										BORING LOCATION:	
GROUNDWATER <u>None Observed</u>										GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE	DATE STARTED: <u>4/5/07</u>		
				DIA.		<u>Geo probe</u>			DATE FINISHED: <u>4/5/07</u>		
				WT.					DRILLER: <u>Victor</u>		
				FALL					GEOLOGIST: <u>Mark Chin</u>		
* POCKET PENETROMETER READING										REVIEWED BY:	

DEPTH	STRATA	SAMPLE				RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS PW moisture
		NO.	TYPE	BLOWS PER 6"							
						100	Red Brown		Silty Sand little m-f Gravel		0 PID
5						90	Red Brown		Silty Sand some m-f Gravel		0 PID
10						100	Red Brown		Silty Sand little m-f Gravel		0 PID
15									End of Boring 12'		
20									Sample collected at 6'-8'		
25											
30											
35											

COMMENTS: Sampled analyzed for Formaldehyde 8315A

PROJECT NO.: Queens EMS
BORING NO.: SB-05

LiRo Engineers, Inc.										BORING NO. <u>SB-06</u>	
PROJECT <u>Queens EMS</u>										SHEET: <u>1 of 1</u>	
CLIENT <u>NYC DDC</u>										JOB NO: <u>07-16-205 #12</u>	
BORING CONTRACTOR <u>ADT</u>										BORING LOCATION:	
GROUNDWATER <u>None Observed</u>										GROUND ELEVATION:	
DATE	TIME	LEVEL	TYPE	TYPE	CAS	SAMPLER	CORE	TUBE	DATE STARTED: <u>4/5/07</u>		
				DIA.		<u>Geoprobe</u>			DATE FINISHED: <u>4/5/07</u>		
				WT.					DRILLER: <u>Victor</u>		
				FALL					GEOLOGIST: <u>Mark Chin</u>		
* POCKET PENETROMETER READING										REVIEWED BY:	

DEPTH	STRATA	SAMPLE				DESCRIPTION				CLASS USCS	REMARKS MOI moisture
		NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION			
					90	Red Brown		Silty Sand Some m-f Gravel		OPID	
5					100	Red Brown		Silty Sand little m-f Gravel		OPID	
10					90	Red Brown		Silty Sand little m-f Gravel		OPID	
15								End of Boring 12'			
20								Sampled collected at 2'-4' and 6'-8'			
25											
30											
35											

COMMENTS: Sampled analyzed for Formaldehyde 8315A

PROJECT NO.: Queens EMS
BORING NO.: SB-06

LiRo Engineers, Inc.

BORING NO. SB-07

PROJECT Queens EMS

SHEET: 1 of 1

CLIENT NYC DDC

JOB NO: 07-16-205 #12

BORING CONTRACTOR ADT

BORING LOCATION:

GROUNDWATER None Observed

CAS. SAMPLER CORE TUBE

GROUND ELEVATION:

DATE TIME LEVEL

TYPE

TYPE

Geo probe

DATE STARTED: 4/5/07

DIA.

WT.

FALL

2"

DATE FINISHED: 4/5/07

DRILLER: Victor

GEOLOGIST: Mark Chin

* POCKET PENETROMETER READING

REVIEWED BY:

DEPTH	STRATA	SAMPLE				DESCRIPTION				CLASS USCS	REMARKS	
		NO.	TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY	HARDNESS	MATERIAL DESCRIPTION		PIV	moisture
					100	Red Brown			Silty Sand little m-f gravel			0 PID
5					90	Red Brown			Silty Sand little m-f gravel			0 PID
10					100	Red Brown			Silty Sand			0 PID
15					100	Red Brown			Silty Sand			0 PID
20					100	Red Brown			Silty Sand			0 PID
25									End of Boring at 20'			
30									No Samples Taken			
35												

COMMENTS:

PROJECT NO.: Queens EMS

BORING NO.: SB-07

APPENDIX B
LABORATORY ANALYTICAL RESULTS

EMSL Analytical

<http://www.emsl.com>

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: 8568584571

EMSL

Attn: Bob Kreuzer
Liro Group
690 Delaware Avenue
Buffalo, NY 14209

Phone (718) 321-3136
Fax: (718) 321-3422

4/24/2007

The following report covers the analysis performed on samples submitted to EMSL Analytical on 4/18/2007. The results are tabulated on the attached data pages for the following client designated project:

Project ID: Queen Hospital

The reference number for these samples is EMSL Order #010701698. Please use this reference when calling about these samples.

If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:

Laboratory Director or other
approved signatory
NJ-NELAP Accredited:04653



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.

**EMSL Analytical**

3 Cooper St., Westmont, NJ 08108

Phone: (866) 858-4800 Fax: 8588584571 Email: jsmith@emsl.com



Attn: **Bob Kreuzer**
Liro Group
690 Delaware Avenue
Buffalo, NY 14209

Fax: (718) 321-3422

Phone: (718) 321-3136

Customer ID: LIRO50

Customer PO:

Received: 04/05/07 2:50 PM

EMSL Order: 010701698

EMSL Proj: Queen Hospital

Report Date: 4/24/2007

Client Sample Description TP-3

Collected: 4/2/2007

Lab ID: 0001

Test	Method	Parameter	Concentration	Units	RL	Analysis Date/Time	Analyst
Lionville Lab	Subcontract	See Attached			N/A		

Lionville Laboratory, Inc.

Report Date: 04/23/07 10:12
 RFW Batch Number: 0704L102 Client: EMSL ANALYTICAL Work Order: 60151001001 Page: 1

Cust ID:		TP-3	BLK	BLK BS	BLK BSD
Sample Information	RFW#:	001	07LLC007-MB1	07LLC007-MB1	07LLC007-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg
=====					
Formaldehyde		29.0 U	25.0 U	86 %	104 %
=====					

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Queen Hospital

EMSL Project # 010701018

Chain of Custody / Analysis Request Form
Print ALL Information. Incomplete chain of custody could result in the delay of analysis.

EMSL Analytical, Inc.
Environmental Chemistry Lab Service
3 Cooper St., Westmont, NJ 08108
TEL: (856) 858-4800 FAX: (856) 858-4571

Account Rep:
Indicate State where samples were collected:

REPORT RESULTS TO:

Name: Steve Frank

Company L180

Address 690 Delaware Ave

City Buffalo

State NY Zip

Tel: 718 321 3136 Fax:

Email: Frankes@L180.com

SEND INVOICE TO:

Name: PO#:

Company

Address

City

State

Tel:

Fax:

of Samples in Shipment:

TURNAROUND TIME

Standard Turnaround Time is 10 working days ☐

The following turnaround times require lab approval:

☐ 5 day ☐ 96 Hrs ☐ 72 Hrs ☐ 48 Hrs

☒ 24 Hrs Approved by

PROJECT NAME: Queen Hospital

Date of Sample Shipment:

List Method and Test Needed

Sampled by: (Signature)

Matrix

Preservative

Sampling

Lab Sample Number	Client Sample ID	Comp	Grab	WATER	SOIL	AIR	SLUDGE	OTHER	HCl	HNO3	H2SO4	OTHER	DATE	TIME	Condition Noted
1. -1	TP-3		X		X								4/7/07		Formaldehyde Method 938A
2.															
3.															
4.															
5.															
6.															
7.															
8.															
9.															
10.															

Released By Signature	Date & Time Released	Delivery Method	Received By Signature	Agency	Date & Time Received	Condition Noted
White Cap Biller with	4/5/07 16:45	EMSL	Biller with 4/5/07	EMSL	4/5/07 13:40	4/5/07

Please indicate reporting requirements: ☐ 1. Results Only ☐ 2. Results and QC ☐ 3. Reduced Deliverables ☐ 4. Disk Deliverable ☐ 5. Other

Comments:

EMSL Analytical

<http://www.emsl.com>

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: 8568584571

EMSL

Attn: **Bob Kreuzer**
Liro Group
690 Delaware Avenue
Buffalo, NY 14209

Phone (718) 321-3136
Fax: (718) 321-3422

4/24/2007

The following report covers the analysis performed on samples submitted to EMSL Analytical on 4/18/2007. The results are tabulated on the attached data pages for the following client designated project:

Project ID: Queens EMS

The reference number for these samples is EMSL Order #010701696. Please use this reference when calling about these samples.

If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:

Laboratory Director or other
approved signatory
NJ-NELAP Accredited:04653



The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.

**EMSL Analytical**

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: 8568584571 Email: jsmith@emsl.com



Attn: **Bob Kreuzer**
Liro Group
690 Delaware Avenue
Buffalo, NY 14209

Fax: (718) 321-3422

Phone: (718) 321-3136

Customer ID: LIRO50

Customer PO:

Received: 04/06/07 4:50 PM

EMSL Order: 010701696

EMSL Proj: Queens EMS

Report Date: 4/24/2007

<i>Client Sample Description</i>		B-1 (6-8)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0001
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			
<i>Client Sample Description</i>		B-2 (16-18)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0002
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			
<i>Client Sample Description</i>		B-2 (6-8)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0003
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			
<i>Client Sample Description</i>		B-3 (2-4)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0004
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			
<i>Client Sample Description</i>		B-4 (2-4)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0005
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			
<i>Client Sample Description</i>		B-5 (6-8)	<i>Collected:</i>		4/5/2007	<i>Lab ID:</i>		0006
<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>	
Lionville Lab	Subcontract	See Attached			N/A			

**EMSL Analytical**

3 Cooper St., Westmont, NJ 08108

Phone: (866) 868-4800 Fax: 8568584571 Email: jsmith@emsl.com



Attn: **Bob Kreuzer**
Liro Group
690 Delaware Avenue
Buffalo, NY 14209

Fax: (718) 321-3422

Phone: (718) 321-3136

Customer ID: LIRO50

Customer PO:

Received: 04/06/07 4:50 PM

EMSL Order: 010701696

EMSL Proj: Queens EMS

Report Date: 4/24/2007

<i>Client Sample Description</i>	B-6 (2-4)	<i>Collected:</i>	4/5/2007	<i>Lab ID:</i>	0007
----------------------------------	-----------	-------------------	----------	----------------	------

<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>
Lionville Lab	Subcontract	See Attached			N/A		

<i>Client Sample Description</i>	B-6 (6-8)	<i>Collected:</i>	4/5/2007	<i>Lab ID:</i>	0008
----------------------------------	-----------	-------------------	----------	----------------	------

<i>Test</i>	<i>Method</i>	<i>Parameter</i>	<i>Concentration</i>	<i>Units</i>	<i>RL</i>	<i>Analysis Date/Time</i>	<i>Analyst</i>
Lionville Lab	Subcontract	See Attached			N/A		

Lionville Laboratory, Inc.

RFW Batch Number: 0704L097 Client: EMSL ANALYTICAL HPIC scan Work Order: 60151001001 Page: 1 Report Date: 04/23/07 10:10

Sample Information	RFW#:	001	002	003	004	005	006
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Cust ID: B-1 (6-8) B-2 (16-18) B-2 (6-8) B-3 (2-4) B-4 (2-4) B-5 (6-8)

Formaldehyde: 26.5 U 27.2 U 27.5 U 27.2 U 26.8 U 27.0 U

Sample Information	RFW#:	007	008	07LLC007-MB1	07LLC007-MB1	07LLC007-MB1
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Cust ID: B-6 (2-4) B-6 (6-8) BLK BLK BS BLK BSD

Formaldehyde: 32.2 U 29.2 U 25.0 U 86 % 104 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Signature

EMSL Analytical, Inc.
Environmental Chemistry Lab Service
3 Cooper St., Westmont, NJ 08108
TEL: (856) 858-4300 FAX: (856) 858-4571

Chain of Custody / Analysis Request Form
Print ALL Information. Incomplete chain of custody could result in the delay of analysis.

EMSL Project # 0107161696
Account Rep: _____
Indicate State where samples were collected: _____

REPORT RESULTS TO:
Name: Debbie Krendeel
Company: EMSL Analytical
Address: _____
City: _____ State: _____ Zip: _____
Tel: _____ Fax: _____

SEND INVOICE TO:
Name: _____ PO#: _____
Company: SHAW-W
Address: _____
City: _____ State: _____ Zip: _____
Tel: _____ Fax: _____

TURNAROUND TIME
Standard Turnaround Time is 10 working days ☒
The following turnaround times require lab approval:
☐ 5 day ☐ 96 Hrs ☐ 72 Hrs ☐ 48 Hrs
☐ 24 Hrs Approved by _____
PROJECT NAME: _____

EMail: _____
Date of Sample Shipment: 4/9/07

of Samples in Shipment: 8

List Method and Test Needed

Sampled by: (Signature) _____

Lab Sample Number	Client Sample ID	Comp	Grab	Matrix						Preservative				Sampling		Condition Noted
				WATER	SOIL	AIR	SLUDGE	OTHER	HCl	HNO3	H2SO4	OTHER	DATE	TIME		
1.	B-1 (6-8)		X		X											Formaldehyde 8315A
2.	B-2 (16-18)															
3.	B-2 (6-8)															
4.	B-3 (2-4)															
5.	B-4 (2-4)															
6.	B-5 (6-8)															
7.	B-6 (2-4)															
8.	B-6 (6-8)															
9.																
10.																

Released By Signature: *[Signature]*

Date & Time Released: 4/9/07

Delivery Method: Fed-EX

Received By Signature: _____

Agency: _____

Date & Time Received: _____

Please indicate reporting requirements: ☒ 1. Results Only ☐ 2. Results and QC ☐ 3. Reduced Deliverables ☐ 4. Disk Deliverable ☐ 5. Other _____

Comments: _____

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FMS ID: F175QUEEN



**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

NEW EMS STATION 50

LOCATION: 159-10 Goethals Avenue
BOROUGH: Queens 11432
CITY OF NEW YORK

Contractor

Dated _____, 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20____

